BALLY MANUFACTURING CORPORATION, a Delaware corporation,

Plaintiff/Counterdefendant,

vs.

D. GOTTLIEB & CO., a corporation, WILLIAMS ELECTRONICS, INC., a corporation, and ROCKWELL INTERNATIONAL CORPORATION,

Defendants/Counterplaintiffs.

) Docket No. 78 C 2246
) Chicago, Illinois
) January 6, 1984
) 10:00 a.m.

VOLUME IV-A
TRANSCRIPT OF PROCEEDINGS
BEFORE THE HONORABLE JOHN F. GRADY

TRANSCRIPT ORDERED BY: MR. JEROLD B. SCHNAYER
MR. MELVIN M. GOLDENBERG

APPEARANCES:

For the Plaintiff/
Counterdefendant:

MR. KATZ
MR. SCHNAYER
MR. TONE
MS. SIGEL

For the Defendants/
Counterplaintiffs:

MR. LYNCH
MR. HARDING
MR. GOLDENBERG
MR. ELLIOTT
MR. RIFKIN
MR. GOTTLIEB

Court Reporter:

LAURA M. BRENNAN
219 South Dearborn Street, Room 1918
Chicago, Illinois 60604

(The following proceedings were had in open Court:)

THE COURT: Good morning.

MR. LYNCH: Good morning, Judge.

(Brief interruption.)

THE CLERK: Case on trial.

THE WITNESS: Good morning, your Honor.

THE COURT: Good morning.

JEFFREY E. FREDERIKSEN, PLAINTIFF'S WITNESS, PREVIOUSLY SWORN.

CROSS EXAMINATION (Continued)

BY MR. GOLDENBERG:

Q. Mr. Frederiksen, do you have a copy of the reissue patent, Plaintiff's Exhibit 3, available to you up there?

A. No, I do not.

Q. In the course of your direct testimony, you made use of the word, architecture.

Could you explain what you mean by that?

A. It is the peculiar placement of electronic elements to create a specific application circuit.

Q. Can you agree with me, sir, that you can use a block diagram to indicate generally the architecture of an electronic system?

A. Yes, generally.

Q. All right, sir.

What I have attempted to do here is to have

such a block diagram which, I believe, represents the architecture of the '441 patent in suit.

I want to see if you can tell me whether I have it correct or incorrect.

If we start here on the left-hand side, I have a block indicating a microprocessor. Any time you want to, sir, as I put questions to you, do refer to your patent or anything else that you think would be helpful to you.

Can we agree that there is a microprocessor in the '441 patent?

A. Yes.

Q. Can we agree that connected to that microprocessor are memory elements, and that is shown by a block labeled, "Memory," and with a thickened line leading to the microprocessor? Is that a fair representation?

A. Yes.

Q. Also, below the microprocessor we have a block labeled, "I/O including registers."

I intend that I/O stand for input/output.

Can we agree that this block fairly represents the registers shown in the patent in Figure 5 and numbered 59, 60, and 58?

A. Yes.

Q. All right, sir.

Now, outputting from the memory and also in-

putting to the memory, we go to two decoders, an upper decoder labeled one-of-sixteen decoder and a lower decoder having the same label.

Is that accurate, sir?

A. Yes.

Q. Now, the upper decoder is shown as controlling a group of solenoids.

Is that accurate as far as the patent is concerned?

A. Yes.

Q. The lower decoder shows 16 lines coming out of it and going to three blocks labeled respectively, "Lamps, switches, and numeric displays."

Is that accurate, sir?

A. Yes.

Q. Now, coming out of the I/O, we go to a lamp drive, which then shows an input to the block labeled "Lamps," which represent the lamps in the matrix. Is that correct?

A. Yes.

Q. And continuing down, the next unit is labeled "Switch input," and that comes from the block labeled "Switches," with an arrow pointing toward the switch input to show that information is coming from the switches through the switch input to the I/O registers. Is that correct?

A. Yes.

Q. Now, at the bottom with an arrow pointing toward it from the registers we have the segment drive, going to the block representing the numeric displays. Is that accurate, sir?

A. Yes.

Q. Now, in addition to that, in order to have these, the two decoders and these drives work together, we show two lines coming out of the microprocessor labeled "Strobes," going to the decoders and to the lamp drive, the swith input, and the segment drive. Is that accurate, sir?

A. Yes.

Q. Would you agree that in block diagram form that's a fair representation of the system architecture of the '441 patent?

A. Yes, in as far as it's the system architecture and not including the software, that's correct.

Q It does not include the soft -- but it represents, I believe, what is referred to as the hardware.

A Yes.

Q Is the program sometimes referred to as the software?

A Yes.

Q All right, thank you, sir.

Now, in the course of your testimony there's been a lot of talk about a low beta transistor. Could you explain to the Court what the beta of a transistor is?

A Transistor is a current amplifier, and the amount of gain that it has, or, in other words, if you put in one unit of current, the amount of current that comes out is referred to as the beta of the transistor.

So if you put in, for example, one unit of current into a transistor with a beta of 1,000, 1,000 units of current would come out.

Q And if you put in one unit of current in a transistor with a beta of 100, 100 units of current would come out. Is that correct, sir?

A Yes.

Q Now, do you consider a transistor with a beta of 100,000 to be a low beta transistor?

A Relative to the drive currents, yes, it was.

Q Could you explain that answer, sir?

A Well, as I said, the transistor is only an amplifier;

it has to start with something.

If you, for example, put in typically one milliamp of current into a beta transistor of 1,000, it would output one amp.

Q But it would be multiplying that signal by 1,000, would it not?

A Yes.

2-2

yes

Q Now, there are transistors that have betas much lower than a thousand, aren't there?

A Yes.

Q Now, is -- in any given transistor is the beta constant, regardless of the input current?

A No.

Q It varies as a function of the input current, doesn't it?

A Yes, it does.

THE COURT: Excuse me. What was that question, Mr. Goldenberg?

MR. GOLDENBERG: In any given transistor is the beta constant, regardless of the value of the input current.

BY MR. GOLDENBERG:

Q Now, is the transistor, one of the transistors you used in your Flicker circuit, which is 6043, is that a low beta transistor?

A I don't recall the specification specifically of the 6043.

Q All right, sir. Now, again in the course of your direct examination you made reference to a game, Shuffle Alley. Could you explain to the Court what a Shuffle Alley game is?

A Shuffle Alley is a bowling game that uses a pin rack or a bowling pin rack on a playfield that is a little bit longer than a pinball machine, with a puck that you slide down the

alley. It's a table game very similar in size to like a pinball.

Q. Well, it's usually somewhat longer, isn't it?

A. Yes.

Q. And at one end of this playfield they have these bowling pins or things that look like bowling pins hanging down from a canopy. Isn't that about correct?

A. Yes.

Q. And underneath each one of those pins there's a switch on the table of the playfield, isn't there?

A. There's an arrangement of switches. Whether or not they are underneath each pin I really couldn't tell you.

Q. All right, sir. And the player slides this puck down the table and attempts to hit those switches underneath those pins as though he were actually in a real bowling game.

A. Yes.

Q. And depending on which one of those switches he hits, one or more of the pins will sort of flop up out of -- into this canopy as though he had knocked the bowling pin down. Would you agree with that?

A. Yes.

Q. When was the first time you saw a Shuffle Alley game?

A. Oh, when I was very young.

Q. All right, sir. Do you know what company makes them?

A. In regards to the ones that I saw when I was very young? I don't recall.

Q. How about within the past few years?

A. I believe Williams makes one.

Q. Do you know of any other company?

A. I don't know.

Q. Did you ever run any tests on the Shuffle Alley?

A. We did a -- we played with a Shuffle Alley once, many years ago at DNA. I don't recall the details of that.

Q. Who is "we"?

A. Dave Nutting and I.

Q. Was this at a trade show?

A. No. This was one that we had constructed back in those days.

Q. What were those days, what time period are we talking about?

A. While we were still in Milwaukee at DNA.

Q. Was this before or after you did the Flicker conversion?

A. I believe it was after the Flicker.

T3

Q Well, before you did the Flicker conversion, did you run any tests on the Shuffle Alley to determine its times available for switch closure detection?

A. I do not believe so.

Q. Did you ever run any such tests?

A. We may have since we did actually construct a Shuffle Alley, but I do not recall specifically or explicitly.

Q. The Shuffle Alley that you constructed, did that have a microprocessor control in it?

A. I do not recall right now. I believe it did.

Q. Was this before or after Dave Nutting Associates was acquired by Bally?

A. Before.

Q. What ever happened to that game?

A. I think it went into a Dempsey dumpster.

Q. Why was that?

A. Bally was not interested in doing a shuffle game at that time.

Q. Did you throw out the microprocessor control, too, if it had one?

A. I do not have anything today. So it must have been discarded.

Q. Do you remember as a result of whatever test you might have run on this Shuffle Alley that you constructed what the switch closure times were?

A. I do not recall.

Q. So you do not recall whether they were closed for a long period of time or a short period of time?

A. They were pretty fast. We were concerned about the puck bouncing off the back and being reactivated on bounce off the back wall. I remember that.

Q. Now, also, in your direct testimony, you made reference to an instruction in the computer program listing for the Flicker conversion, the KPB instruction. Do you recall that?

A. No. It was the KBP.

Q. I am sorry, K --

A. B --

Q. BP.

Do you recall that you spoke of that in your direct testimony?

A. Yes.

Q. Now, would it be correct, sir, that this instruction is one that appears in the Intel manuals that you used?

A. Yes.

Q. Would it also be correct that the purpose of this instruction is to cause switches to not register anything into the computer if more than two of them are closed at the same time?

A. No. It registered into the computer that more than one has been closed, so that you could act on the false activation if you chose.

Q If you chose to do it, but it does not register the combined scores of the more -- the combined effects of the more than two switches, does it?

All it does it produce a signal saying that more than two switches are closed?

A More than one switch is closed.

Q. I am sorry; more than one switch is closed.

A. Yes.

Q. That is all that it does, and then if you want to take corrective action about that, you can do it.

Now, in the Flicker program, the KBP instruction is included, is it not?

A. Yes.

Q. So that if in a pinball game like Flicker you had a stuck switch, it would be possible for a program to go to the KBP mode and indicate that more than -- I am sorry. Let me withdraw that.

In a pinball game like Flicker, including that instruction, if you have a stuck switch in a given column of switches and then another switch was closed by the ball rolling over it so you now had two closed switches, the KBP instruction would simply provide an indication that more than two switches are closed and the scoring effect of that second switch would not be registered, isn't that correct?

A. Your question is not quite clear, but if you are assuming that the second switch is on the same column --

Q. Yes, sir, I was.

A. -- the score associated with the second switch closure would not be directly scored, that is correct.

Q. So the player in effect would be cheated?

A. Well, in an effort to keep the games fair and being concerned with the prospects of cheating, if you want to use that term, the player, we tried to make sure that some of the switches that were associated on that column would be reacted on with similar scores so he wouldn't be cheated.

In other words, the switch effectively was acted on.

Q. How?

A. As I explained earlier if, for example, the four target switches, as shown in the patent on the multiplexed column with targets A, B, C, and D --

Q. I think you are having reference to Figure 4 of the patent?

A. Yes. Let's assume target A is stuck similar to the stuck switch we talked about earlier, where the metallic contact is permanently closed and it is disabled.

Now let's say that we closed B. With the keyboard process instruction, the KBP instruction now, it would say, "Well, you have your fingers on two switches. We don't know which one you want. So it is an error," and it did do that; but then we memorized, again in a choice to act on this error, the fact that it was confused, and then it came back and when we saw now that target B had disappeared, we then reactivated on target A, giving a similar

score.

Q. All right, sir.

A. So the player was not cheated.

Q. Well, then let's stay with Figure 4 and go to the fourth column from the right in the matrix there, which includes a 3,000 hole pop bumper, a 100s target and a 10s target.

How do you avoid cheating the player in that column of switches?

A. We weren't too concerned about the --

Q. Let's assume that the 10s switch is stuck and it goes into the 3,000 hole.

A. If the 10s switch were stuck and it were to get in the 3,000 hole, in that instance the ball would be stuck in the 3,000 hole, but it would still take the score of the target switch; but the game would be inoperative in that case.

Q. The game would be inoperative?

A. Since the ball would be now stuck, that is correct.

Q. So under certain circumstances with stuck switches in various of the columns, the game becomes inoperative?

A. Yes, although in our experiences the target switches, the problem with them was not sticking; rather, the problem with them was that the leafs actually broke off, which is a permanent opening, not a permanent closing.

So we were not particularly concerned with

the target switches. I had used it as an example previously just because of its simplicity.

Q. But it could happen, couldn't it?

A. Yes, and if it would have been of terrible concern, we would have probably put it in a column by itself.

Q. So it was a defect or a potential defect in the system, wasn't it?

A. No.

Q. You don't agree with that?

A. No, I do not. I told you if I would have agreed with that, we would have put it in a separate column by itself. You see that there are vacant columns.

Q. In the text of the patent, sir, is there any discussion of the KBP instruction and how you could work around it, as you have proposed to do?

THE WITNESS: Could you read the question, please?

BY MR. GOLDENBERG:

Q. In the -- oh, I am sorry. Could you read the question?

(Question read by the reporter.)

BY THE WITNESS:

A. Yes.

BY MR. GOLDENBERG:

Q. Where?

A. In the program attached.

Q. I asked you in the text of the patent. Is there a

program attached to the text of the patent?

A. I would assume so. It was submitted that way.

Q. Do you have anything there in your copy of the patent available to you?

A. No, I do not.

Q. Could you turn to Figure 5 of the patent again, and I have once again put on the easel the enlargement of that Figure 5.

All right, sir, I direct your attention to the lower part of the circuit diagram, which shows a column of switches associated with the reference numeral 97.

Do you see that?

A. Yes.

Q And if we take the first column, at the top of that column we see representation of an electronic device, 98. Do you see that?

A Yes.

Q Could you say what that is?

A That's a diode.

Q What's its purpose?

A It's purpose is to act as an isolator to prevent the switches from causing false activations through sneak paths.

Q And it serves that purpose for all of the switches in the first column in the drawing?

A It is schematically shown as representative for what would be done with all the switches.

Q All right, sir. If we look at the switch in the second row of the column, could you tell me how that diode, 98, prevents a sneak path for that switch?

A Again, this is a combination between a block diagram and a full schematic.

In the full schematic there is a diode attached with each switch, and there is a diode similar to 98 that would be on the short wire going over to the columns which, in this particular drawing, there was really no room to include.

Q There was no room to put a wire going from the bottom of that diode, which has an enlarged circle on it, over to the right, to this vertical line, indicating a conductor

connecting all the switches?

A. All the switches require a diode. The first switch demonstrates how that's put in place.

Q. All right, sir. Can you point to the text in the patent which tells you how that one diode represents all the diodes?

A. I don't think I could specifically right now.

Q. Well...

A. If it's important to you, I'll search it out.

Q. If you bear with me for a moment, sir, I think I have a reference to it -- perhaps will shorten the time required -- where I think that switch is discussed -- that diode is discussed.

All right, sir, directing your attention to column 13, line 42, the sentence starting there.

A. (Witness reading document.)

(Brief interruption.)

THE COURT: Perhaps you could repeat the pending question.

BY MR. GOLDENBERG:

Q. My question is, can you point out to me the text in the patent which points out that the one diode, 98, is simply intended as representative of all the diodes that are supposed to be there?

A. That text is referring to a particular left lane target switch, and it's showing that steering diode 98 between mux

line -- between mux 0 and the input register network is a typical diode with a typical target switch.

It doesn't mean to imply that the left lane target switch is the only switch in the machine, either.

Q All right, sir. And I do tell you that I read the patent and I can't find any other reference or discussion with respect to this diode 98 other than what I have directed your attention to.

A That's true, since in matrix use, you know, steering diodes are normal art and would be normally known to people skilled in the art.

Q But can you agree with me, sir, that your explanation is not provided either in the patent text or the patent drawing?

MR. TONE: Does that explanation, your Honor, refer to the -- what is known to persons of ordinary skill in the art?

I suggest that question is not being clear.

MR. GOLDENBERG: I withdraw the question.

BY MR. GOLDENBERG:

Q Can you agree with me, sir, that your testimony that diode 98 is intended as representative of all the diodes that are supposed to be there, doesn't appear either in the text of the patent or the patent drawing?

A As I said, the steering diode need is indicated, and a person skilled in the art can take care of it from there.

Q Now, sir, is the diode 98 a steering diode?

A Yes.

Q What do you mean by a steering diode?

A Basically directs the current paths through a certain element in a matrix.

Q. Isn't that an isolation diode?

A. It depends on whether it is on or off. If it is on, it is being steered that way. If it is off, it is being isolated.

Which side do you want to look at it from?

Q. Do you believe that to be usual electronic engineers' parlance?

A. What is the question?

Q. Your characterization of the diode 98 as being either an isolation diode or an engineering diode, do you believe that is the way electronic engineers usually describe such devices?

A. That is the way we described it, and that is what I have heard before.

Q. All right, sir.

I show you a drawing that has been identified here as Defendants' Trial Exhibit 2-Q, and I ask if you can identify that, sir.

A. Yes.

Q. Could you state what it is?

A. This is a marked up copy of the Bally Brain.

MR. GOLDENBERG: I am sorry. I was diverted for a moment, and I did not hear your answer. I apologize.

Could the reporter read it back to me as far as you have gone?

(Record read by the reporter.)

BY MR. GOLDENBERG:

Q. Would it be correct that the right hand side of the drawing shows the inputs to the matrix?

MR. TONE: Your Honor, we do not have a copy of that. I am not criticizing counsel, but may we look at it because we do not have a copy?

THE COURT: Sure.

MR. GOLDENBERG: Well, of course. I just have two more questions about it.

MR. TONE: All right. I have seen it, but I did not know what to look at just before the hearing started today.

(Brief interruption.)

MR. TONE: Thank you, your Honor.

BY MR. GOLDENBERG:

Q. I believe my question to you, sir, is: The right hand side of the drawing, does that illustrate the matrix aspect of the Bally Brain?

A. No.

Q. Well, the inputs to the matrix?

A. No. The output --

The decoder marked mux indicates the output to the matrix, the column drivers. The inputs would occur down below.

Q. So the inputs to the matrix are illustrated on the right hand side toward the bottom of the drawing, is that correct?

A. Yes.

Q Now, what is illustrated generally on the center and left-hand side of the drawing?

A I assume you are referring to this center area?

Q Yes, sir.

A Those are the E-PROMS connected to the extender interface, which are then subsequently connected to the microprocessor, the E-PROMS being the prototye ROMS that we used, or prototype program chips.

Q Those are the memory elements of the microcomputer?

A Not all of them. They are part of them.

Q Part of them.

Here the element labeled 4004 CPU, that is the microprocessor?

A Yes.

Q With respect to the left-hand side of the drawing, what does that illustrate?

A Housekeeping circuitry, power supply, and the timer of the clock circuit that drives the microprocessor.

Q Now, the Bally Brain was implemented in the Flicker conversion, was it not?

A Yes.

Q Directing your attention to the transactions involving Mirco, was a game actually sent from Dave Nutting Associates to Mirco in Phoenix, Arizona, at any time?

A Yes.

Q. What was the microcomputer used in that game?

A. The F-8.

Q. The F-8.

The text of your patent refers to an Intel 4040 computer, and you may check it and verify that what I have said to you is correct.

Did you ever design a system using the 4040?

A. Yes.

Q. What system was that, sir?

A. To the best of my recollection, I believe it was Weird Animal Kingdom.

Q. But not a pinball game?

A. No. I don't recall building a pinball game with that.

Q. The Flicker conversion was a 4004?

A. Yes.

Q. The one sent to Mirco was an F-8?

A. I believe so.

MR. GOLDENBERG: I have no further questions, your Honor.

REDIRECT EXAMINATION

BY MR. TONE:

Q. Mr. Frederiksen, Mr. Lynch asked you some questions about the MCS-4 user's manual, Defendants' Exhibit 1-A.

Do you recall that?

A. Yes.

Q In particular, he inquired about pages 51 and 52.

I believe you said at some point in your testimony that you became familiar with that manual while waiting for delivery of the Intellec 4, is that correct?

A Yes.

Q I am going to hand you a copy of pages 51 and 52 of that manual.

Referring to the first paragraph --

Does your Honor have a copy of this?

THE COURT: I do.

MR. TONE: Okay.

BY MR. TONE:

Q In the first paragraph on page 51, Mr. Lynch had you read, I believe, the first two sentences in that paragraph.

Do you recall that?

A Yes.

Q He did not, I believe, read the final sentence in the paragraph.

Would you read that?

A "The engineer who wishes to utilize an MCS-4 system must include as part of his design suitable interface circuits and programs."

Q Does the MCS-4 manual tell you how to make suitable interface circuits and programs?

A No.

Q On page 51 of the manual, following down there is a list of three numbered items. Do you see that?

A Yes.

Q The first two relate to rules for designing an interface, do they not?

A Yes.

Q The third simply tells you that you should design a proper program, is that correct?

A Yes.

Q Referring to these steps and particularly the first two, do they tell you how to interface a microcomputer with a pinball machine?

A No, they do not.

Q There is a reference in item 1 to multiplexers. There are two references in fact to multiplexers. Do you see those?

A Yes.

Q Do those words as used there refer to the multiplexing technique you used in the invention?

A No, they do not.

MR. LYNCH: Objection, your Honor. This redirect is very leading. The direct was extremely leading. This testimony is simply unbelievably leading. I object, your Honor.

MR. TONE: Well, your Honor --

THE COURT: Overruled.

MR. TONE: All right. May I have the question read back?

(The record was read by the reporter as requested.)

BY MR. TONE:

Q. Can you explain what they do refer to as you understand it?

A. Common to electrical engineering or to us in those days were parts called multiplexers. They were parts that allowed you to put a bunch of wires on the input and read one wire at the output, for example. The multiplexers that they were referring to here and I assumed and I think that they intended to mean those parts.

Q. Is multiplexing in this sense -- were any of these parts used on the Flicker or parts of this kind?

A. No.

Q. Will you turn now to page 52 and will you read the paragraph under the table, and by the table, I mean the one that appears just above the middle of the page and the paragraph beginning "Scanning." Read that to yourself.

(Brief interruption.)

BY THE WITNESS:

A. Yes.

BY MR. TONE:

A. Does that paragraph describe scanning for a particular

purpose?

A. No.

Q. Well, does this section, if you look at page 51 together with 52, does this section of the manual refer to keyboards?

A. Yes, this is basically keyboard scanning.

Q. The first part of the discussion under the heading on page 51 is under the heading of "General Discussion," right?

A. Yes.

Q. What we are talking about now is under "B. Keyboards"?

A. Yes.

Q. Will you state whether the system of scanning the keyboard that is described in the paragraph I just asked you to read is the system you used for scanning the switches in the converted Flicker?

A. No, it is not.

Q Wherein does this system differ from the system you used?

A In two characteristics: Multiple column key closures allow a shorting of the columns; the part apparently allows that. That would not be tolerable in the pinball machine.

Also, it allows you to sample all columns simultaneously through this disabling feature explained in the last line, which again we cannot do in the pinball machine.

Q Would the system described in this paragraph have worked in the Flicker?

A No.

Q Why not?

A We cannot disable the column in the matrix that we have in the Flicker.

Q And is the paragraph we're talking about describing matrix multiplexing for use with a keyboard?

A I'm sorry, could you repeat the question?

MR. TONE: Read the question, please.

Q (Read by the reporter.)

BY THE WITNESS:

A It is describing how to matrix multiplex a keyboard, but not of the kind that we were doing in the pinball machine.

It was, for example, not attempting to resolve a closure until after a closure has occurred.

BY MR. TONE:

Q Now, turn back to the general discussion on page 51. Does that say anything about matrix multiplexing for use generally?

A No, it does not.

Q In discussing page 52 with Mr. Lynch while he was cross examining, you said that multiplexing in a cyclical and sequential fashion was standard, at least with respect to a keyboard. Do you recall that testimony?

A Yes.

Q Are there problems in using multiplexing with a pinball machine that do not exist when using multiplexing for a calculator?

A Yes, there are problems.

Q Can you list some of the problems?

A A keyboard has a very slow activation time, and so there's a lot of time to resolve the closure.

Keyboards do typically not want to react on multiple switch closures. In a pinball machine you may wish to. Very often you do wish to.

Those are two particular problems.

Q Is there any problem that is related to the ball hitting the target and then being kicked out?

A There is a problem again with the speed, as we talked about. In other words, whereas in the keyboard the activations are very slow, in a pinball they're very fast. And if the

resolution is not quick enough, of course, you can miss the closure.

Q Does matrix multiplexing itself create any noise or what would amount to a noise problem?

A In conjunction with the power devices, yes, it does.

Q Do these problems exist in a calculator?

A I wouldn't imagine so. There's not very much power consumed in a calculator.

Q Is there any other reason they wouldn't exist in a calculator?

A The general noise environment isn't, in a calculator -- for example, a pinball is connected to the AC line; there's a lot of noise that comes out of that.

But, more importantly, there's a lot of radiated noise from other elements such as solenoids, which don't exist in a calculator.

Q What about length of wires in a calculator as opposed to a pinball machine, wires or leads, you might call them?

A Well, since noise pick-up is through some sort of antenna, yes, the larger wiring in a pinball cabinet is much more susceptible, just by its very size, than it would be in a calculator.

Q And does a calculator have any solenoids?

A No, it does not, typeically.

Q Do solenoids generate noise?

A Yes, they do.

Q Can you explain -- well, first of all, does the fact that wires are longer in one device and shorter in another have anything to with electrical noise?

A Yes. As I mentioned, an antenna -- an antenna's effectiveness is determined by its size, very much like a TV antenna.

Q And is a wire in a sense an antenna?

A Yes, it is. And it picks up that electromagnetic radiation. And that can be very much like picking up a radio signal.

If you have a very small wire or a very small circuit, you can reduce the susceptibility to that kind of radiation noise.

Q Is one method of protecting against noise shielding?

A Yes.

Q Can you compare the feasibility of shielding in a calculator with the feasibility of shielding in a pinball machine?

A Well, since calculators are tiny, of course, shielding is very practical. You can use a piece of aluminum foil.

Obviously, doing something like that in a pinball machine would be very difficult. You might have to, for example, go to shielded wire, which we could not affort.

Q You could not afford it in the sense that -- are you speaking of the -- you could not afford it in the sense of the cost of producing machines having that feature?

A Yes. The shielded wire adds a lot of electronic requirements to drive -- it's a higher drive requirement, since it's-- it adds some other ill effects.

But it's also a very expensive type of wire, rather than just the simple wire that we use in a pinball.

Q Now, I'd like to turn to Defendants' Exhibit 1-I,which is the Fairchild semiconductor manual, the "TTL Applications Handbook."

Do you recall that Mr. Lynch referred to the discussion of multiplexing digital displays on page 3-8 of that manual?

A Yes.

Q And he pointed out that certain advantages are listed there, that is, advantages of multiplexing digital displays.

A Yes.

Q. Does the manual also point out that there are certain disadvantages?

A. Yes.

Q. Does it list those disadvantages under the heading "Disadvantages"?

A. Yes, it does.

Q. Do you understand, reading that as an engineer, that those are considerations that one would balance against advantages in deciding whether to multiplex the digits?

A. Yes.

Q. Among the disadvantages listed are first, "Higher operating voltages or currents required for equivalent brightness."

Does this have anything to do with electrical noise?

A. Yes, it does.

Q. Will you explain that?

A. The shocking of a wire, as I mentioned before, is very much like taking a hammer to a spring. It will bounce for a period of time. How hard you hit it determines how much noise it generates.

If you have higher currents required for a display like in Flicker -- and we did have higher currents rather than the higher voltages or combinations of those -- the current would generate more noise.

Q. The third item on the list of disadvantages says,

"Careful uncoupling of power supplies to stop switching transient is required."

Do you know what that means?

A. Yes.

Q. Will you explain it?

A. They are referring to this noise again. This wreaks havoc with a power supply, and the noise then causes the power supply to fluctuate internally. This, if you are not careful, can feed right back down into the logic and cause the logic to malfunction as well since it typically will feed off the same power supply.

Q. The second item says, "As scan rate must be above one kilohertz to reduce flickering --" I am sorry, "...to reduce flicker."

What scan rate did you use in the Flicker, the Flicker machine?

A. Our scan rates were typically less than 100 hertz.

Q. Did you have flickering lamps in the machine as a result of that scan rate?

A. No, we did not.

Q. What does "hertz" mean?

A. Hertz means cycles per second or scans per second.

So we would scan around the matrix 100 times, less than 100 times per second.

Q. One kilohertz then would be 1,000 cycles per second?

A. Yes.

Q. And you used, as you said, 100 as compared to that, or less than 100?

A. Yes

Q. By the way, Mr. Frederiksen, are you familiar with the patent statute?

A. No.

Q. Referring to Mr. Goldenberg's questions about the low beta transistor yesterday and whether that transistor is shown in Figure 5 of the patent, is that transistor described in the specifications?

A. Yes.

Q. I think you pointed out yesterday and you and he discussed the fact that it is mentioned in column 13, line 54 to 63, right, or at least starting with line 54 and following lines?

A. Yes.

Q. Would a person of ordinary skill in the art, given the specification and the drawing, Figure 5, be able to make and use that circuit with the low beta transistor connected to the ground?

MR. GOLDENBERG: Objection, your Honor. I think this goes to the qualification of the witness to respond to such a question.

THE COURT: What do you think is deficient about

his qualifications?

MR. GOLDENBERG: I don't think he has been shown to have knowledge of people working in the art and their educational levels and working experience and skills.

THE COURT: Let's go into that. We are going to have to go into that at some point in the case anyway.

BY MR. TONE:

Q All right. Tell us whether during the period starting in 1973, when you came to work for Milwaukee Coin, you have had experience with persons in the electronic game art?

A In tne summertime I worked with MCI, and that is the only time.

Q. All right.

A. But prior to actual employment.

Q. You came to work there first as a technician, is that right?

A. Yes.

Q. You continued to work for MCI until you went to Dave Nutting Associates?

A. Yes.

Q. As a technician, right?

A. No, just -- in the beginning -- a very short time in the beginning, I was a technician. Then I went into engineering right away, almost immediately in conjunction with doing the Safe game.

Q. So the work you have done since then can properly be described as engineering?

A. Yes.

Q. What field of engineering would you say you have worked in?

A. Electrical engineering.

Q. Have you associated during that time and over these years with other electrical engineers in your work?

A. Yes.

Q. How many?

A. It is in the hundreds.

Q. Now, prior to that time and referring to your work as a

radio technician and to your education, did you learn to interpret drawings of electrical circuits?

A. Yes.

Q. And the elements of the electrical circuits?

A. Yes.

Q. Was that part of the formal education you received?

A. Yes.

Q. Did you have occasion to use that education while you were working in the armed forces?

A. Yes.

Q. Did you have occasion to use it when you were working in the field of radio?

A. Yes.

Q. Have you had occasion to use it since?

A. Yes.

Q. Are there certain conventions with respect to schematic drawings of circuits that are common in the electrical engineering profession?

A. Yes.

Q. Do those inventions sometimes involve symbolizing a group of circuits by showing one in detail and then letting some kind of an abbreviated symbol stand for the others?

A. Yes.

Q. Have you been familiar with that kind of drawing and that convention for many years?

A. Yes.

THE COURT: Mr. Goldenberg, I will let you cross examine if you wish.

One thing I am interested in is the art we are dealing with here. Mr. Tone mentioned both the art of electronic games and the field of electrical engineering.

What is the art whose -- or the art, ordinary skill in which is involved in this case? Is it electrical engineering, or is it a more narrow field of electronic games?

MR. TONE: I think, your Honor, there are two arts involved, or there were when this invention was created. One was the field of electromechanical pinball games, which did not involve electronics, and that was a well-established art that had been in existence for about three decades.

There was also the field of electronics, which is properly a branch of electrical engineering.

Of course, as we believe the evidence will show, those two arts were not mated with respect to the pinball art in the invention in this case. So I think you have to look at both arts, and this witness had his experience in electrical engineering and math and physics related to electrical engineering.

He was not and has never been an electromechanical pinball designer. So he took his information, as he testified, from somebody else on that subject.

THE COURT: What is the difference between electrical and electronic? I have wondered that long before I ever heard of this case. I do not know the difference.

MR. TONE: May we ask the witness that?

THE COURT: Yes.

What is the difference?

THE WITNESS: Electrical is more nuts and bolts. It is really easier to deal with. It is basically the passing of electrical current through a piece of wire.

So electrical engineering does deal with things like motors and whatnot.

In fact, Milwaukee is notorious for electrical engineering not being electronic. They typically have like Louis Allis and corporations like that, Allis-Chalmers.

On the other hand, electronic engineering deals with a device like a transistor that has some peculiar ability to do something with these electrons other than just simply pass them along like a pipe. That gets into this whole area of electronics.

THE COURT: Of course, people were doing things with electricity long before they ever heard of transistors.

THE WITNESS: Of course, and including relays. As a matter of fact, a lot of the earlier machines did require electrical engineering, but more of the electro-

mechanical nature.

THE COURT: So actually the distinction is more between electromechanical using electricity to drive some mechanical device on the one hand and a solid state type work on the other?

THE WITNESS: More at the molecular level, that is correct. But they are both electrical engineers technically.

There is some difficulty in that they do not like to cross bounds too much. People that build these large power transformers for power companies and whatnot do not like to design electronics a lot of times, that is true. So there has been a narrowing in their separation.

THE COURT: Mr. Goldenberg, do you want to cross-examine now, or do you want to argue, or what do you want to do?

MR. GOLDENBERG: Judge, I guess -- almost it goes without saying, if I were on the stand, which I do not propose to do, I would not agree with much of what the witness has to say. Therefore, I would like to ask a few questions.

THE COURT: Sure. Go ahead.

VOIR DIRE

BY MR. GOLDENBERG:

Q Is it your position, sir, that electrical engineers

did not in recent years deal with electronic matters and electronic devices?

A No, not at all.

Q But what is this distinction you have drawn? I am not understanding it.

A Electrical engineering -- since the generation of electronics has created a much wider territory to explore and just because of the physical limitation of time, people have narrowed down whereas historically electrical engineering always included electromechanical devices, today includes electromechanical devices plus electronics. Each one of those are vast territories in themselves.

Q Do you have any familiarity with the curricula of engineering universities and colleges in recent years?

A Not directly.

Q How about from 1974 on?
A Yes.
Q How did you gain that familiarity?
A By going to college.
Q Which one?
A Starting at St. Thomas College up in St. Paul; more recently, in the years that you're talking about, the University of Wisconsin - Milwaukee.
Q What course did you take there?
A Circuits, Devices and Systems was one course that I took; we'd also had some other electrical engineering courses in systems analysis and whatnot.
Q Did you work with solid state devices, study them?
A Yes, we had studied the transistor and amplifiers and amplifier configurations.
Q All right, sir. Now, your own background, whether you call it electrical engineering or electronic engineering, was in the field of electronics to some degree, was it not?
A Yes.
Q And when you came to this matter you knew something about that subject, didn't you?
A Yes.
Q The thing you didn't know anything about was pinball games. Isn't that correct?
A Yes, beyond --

Q Other than this general familiarity that any one of us has from wasting our youth in arcades.

A That's correct.

Q And so you had to learn something about pinball in order to complete the task you were asked to complete. Isn't that it?

A Yes.

Q And you then brought your knowledge of electronics, electricity, to bear on that and you were able to do it. Isn't that correct?

A Yes.

Q So that the basic skills that you required were knowledge of electronics. Isn't that correct?

A Yes.

MR. GOLDENBERG: I have no further questions, your Honor, on that subject.

THE COURT: Well, I think the witness is qualified to answer the question Mr. Tone put.

MR. GOLDENBERG: All right.

THE COURT: I mean, you may have some reservations that go to the weight of it, but I don't think it affects the admissibility.

So I'll overrule the objection.

MR. TONE: Can the reporter find the question?

THE COURT: I don't think we better ask her to,

Mr. Tone.

MR. TONE: All right, fine.

THE COURT: Put it again.

MR. TONE: I'll go back to it.

THE COURT: I recall myself, I think, what it was.

MR. TONE: I recall, I believe, your Honor.

REDIRECT EXAMINATION (Resumed)

BY MR. TONE:

Q It was whether a person of ordinary skill in the art, given the specifications and the manual -- or, rather, the drawing, Figure 4 of the patent, would be able to make and use the circuit with the low beta transistor connected to the ground.

A Yes.

Q Now, referring to your program listing for the Flicker, which is Plaintiff's Exhibit 30, did you write that program listing? Were you the author of it?

A Yes.

Q Did the instruction set of the Intel user's manual which Mr. Lynch asked you about teach you the language to be used in writing that program history?

A Yes.

Q And after learning the language that had to be used in writing the program listing did you then write the pro-

gram listing using that language?

A Yes, I did.

Q Is the language in the manual like the notes a composer would use in writing a musical composition?

A Very much so.

Q On cross-examination by Mr. Lynch you testified that the noise spike could be as short as, I think you said, 5 billionths of a second. Is that right?

A Yes.

Q And then you also mentioned something about the density of noise spikes. Do you recall that?

A Yes.

Q What did you mean by density?

A Density of noise spikes is very much like thinking of the teeth of a comb, whether or not there's a lot of teeth or very few teeth, and so therefore how often they occur.

The spikes may be very narrow still, but there could be a lot of them.

Q During the time, the time period that the strobe is on any one column in your invention, can there be many spikes, noise spikes?

A Yes, there could be several.

Q You said that you found in your work on the Flicker that from one to several of these spikes would be detected

during a game. Is that -- did I correctly understand that?

A Again, the density can be very heavy but the probability of hitting at the exact instant of sampling, because it is still a very, very narrow spike, is not very great.

And so you could have literally within the play of a game you could have millions of these spikes. But the probabilities of them coinciding with the sampling period may only be 2 or 3 times per game.

Q So that would be 2 or 3 times a game that they would be detected by the sampling?

A Yes.

Q What would happen in the operation of a game designed without sufficient noise immunity when even one of those noise spikes is sensed by the microcomputer?

A If you mean sensed by the microcomputer through an input switch such as a coin switch, you might get a false coin activation; but if on the other hand you mean that the microcomputer itself gets the noise spike and it's not the switch that got the noise spike, it could cause its program counter to lose count and it could actually just go do something it's not supposed to do at all.

Q That could be caused by one of these noise spikes if it happened to be sensed by the microcomputer?

A The noise spikes that you are referring to as far as several activations per game, those were switch noise spikes and they definitely can be sensed by the microcomputer.

Q Could one noise spike hang up the machine?

A No. Again, not at the switch input, but if it were attacking the microprocessor directly, it could.

Q If it got to the microprocessor, could it hang up the machine?

A Yes, it could.

Q Referring to your testimony yesterday during Mr. Goldenberg's cross-examination when you spoke of having designed an electronic pinball game that would do the same thing as an electromechanical pinball game, wasn't it a main object of your invention to make a pinball game which played just like the conventional electromechanical pinballs but used an electronic system?

A Yes.

THE COURT: If you are going to go on to another question, I wanted to ask one on that subject.

MR. TONE: Surely, yes, your Honor.

THE COURT: What were the advantages of a solid state version, in addition to the economies you mentioned, if any? Was it entirely a matter of fewer parts and,

therefore, less expense, or was there some other desirable aspect?

THE WITNESS: There were two points here. One was the economy issue, which, you know, we have talked about declining costs over the years might have happened anyway; but the other one was that in those days nothing was real unless you could see it.

There was no such thing as something that was illusionary in the pinball business. The digits stayed there all the time. They didn't scan. There was no multiplexing.

So I remember that Dave Nutting had a lot of problems, being of an electromechanical background himself, trying to understand this idea of time division multiplexing, how you could have an illusion of something being there all the time.

The advantage of that, though, which is the point I am trying to make here, is that it allowed me to come up with a general piece of electronics that I didn't have to change in hardware from game to game but rather primarily in software with lamp reorganizations and switch reorganizations.

The prior art taught that every game required random logic, not some ordered machine like this, and that you had to build a different one for every different game.

So that is really more important, is that you could come up with a unique piece of machinery here, I would think, that can stick around for several games.

BY MR. TONE:

Q Further with respect to his Honor's question, did the use of the microcomputer to drive the pinball machine and control it enable you to put features on the machine that couldn't be there using an electromechanical system?

A Yes, because of its speed, we could do these illusionary things like multiplexing, and then also because of the larger programmability, you could add a lot of features for essentially free.

Q Such as what? What features could you add?

A Every logic function didn't require adding hardware. So you could just simply add as much logic to a pinball machine as you would like. It was really unbounded.

Q What benefit would this logic have?

A It would allow us to do a lot more with the pinball machine than had ever been done before.

Q Well, can you give us an example?

A Well, in conjunction with the Flicker, that is difficult to do because our intention there was to exactly replicate, but in the --

Q We understand that, but what would the advantages be, as his Honor inquired, of having an electronic system

rather than an electromechanic system, other than the advantages you have described?

A Except for the fact that -- now assuming that by electronic system you are excluding random logic, electronics would be different--

Q No, I mean in a microcomputer system.

A In the microprocessor system we would have the same system from game to game, but these other advantages, like added features and whatnot that we were able to do quite handily.

Q All right, take an example of an added feature. Was there something you could do with a computer controlled game that involved two players and restoring the playfield to a certain condition after the second player took his turn?

A Yes.

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MR. GOLDENBERG: Objection to the leading.

MR. TONE: Well, I am trying to call his attention to something, sir.

THE COURT: Well, I think you are in a leading area now. You can call his attention to it, I think, without being quite so specific.

MR. TONE: All right.

THE COURT: On the other hand, in the area of expert witnesses generally I don't think leading is that much of a problem. So there is something to be said for both sides, but I think it is a little leading.

MR. TONE: All right, I was trying to call his attention to a particular matter.

I might say generally, your Honor, that I couldn't lead this witness if I desired to do so.

THE COURT: Well, that is my point --

MR. TONE: Which is your Honor's point.

THE COURT: -- generally as regards experts. However, there are experts and experts in that respect, as well as many others. So I wouldn't accept that as a general proposition.

BY MR. TONE:

Q Is there a feature of the machine that relates to the condition of the playfield when two players are playing?

A Yes, this is playfield memory.

Q Will you explain that to the Court?

A In the microprocessor, since we had the ability to have memory, we could memorize the condition of the first player's lamps and whatnot and reinstall those.

Then when the second player would play, he would play with the condition of the playfield at that point in time.

That was something that before that time was not practical to do with an electromechanical system since the memory function would have been incredibly expensive.

Another thing we did, not related to the playfield memory, was memory from game to game, which I thought was a neat feature. We really have never done it, but this is the idea like bowling leagues, where you have a series of games. You could memorize a series of scores from game to game.

This was something that was also easier to do in a microprocessor system.

Q You have used terms that may or may not be familiar to the Court, memory and recall.

I will ask you to explain those terms, but I would add that if the Court doesn't feel an explanation would be helpful, I will withdraw the question.

THE COURT: Oh, no, go ahead. I don't think

that would hurt.

BY THE WITNESS:

A The memory function is very much like a memory function on a calculator, if you have ever used that, where you can have a number, save it off, and do something else and then call that number back and continue.

In a pinball machine we could save the status of the playfield that a player had. You would get certain bonuses accrued. It is like accruing a number. Then after you were done with your turn, because the ball went out and it is a two-player game, the other player comes up. Rather than have him take your board position, we would give him his own board position clean again. We would save your board position where you were at, let him play, and then bring back your board position when it was your turn again.

THE COURT: Had that never been done electro-mechanically?

THE WITNESS: Not to my knowledge.

THE COURT: And does the Flicker do that?

THE WITNESS: I believe so.

BY MR. TONE:

Q There was a discussion about Figure 5 this morning relating to diode 93. Do you recall that?

A Yes.

Q I think you said that it was shown as representative of an arrangement for all switches.

Did I correctly understand or do I correctly paraphrase what you said?

A Yes.

Q Will you explain what you meant by that?

A Very much like the transistors, it is very typical to draw an example of one on one of the switches, and then the others are assumed to do likewise.

Once it is understood that isolation diodes or steering diodes are necessary, it would be very obvious then to apply it to the rest of the switches, very much in the same way that you would with the transistors.

Q Regarding the use of the term "steering diodes," Mr. Frederiksen, which you used in response to one or more of Mr. Goldenberg's questions concerning diode 98 in Figure 5 of the patent, would you look at column 13, lines 27 to 30, and read that passage?

(Brief interruption.)

BY MR. TONE:

Q Read it aloud, if you would. It is very short.

A Column 13, starting line 27?

Q I am sorry. It is column 10. I misread my note. I apologize.

It is column 10, starting with line 27.

The beginning words are, "The devices...."

A "The devices thus can jointly operate to provide a corresponding circuit path to the input or steering means at particular intercept points of the multiplexed circuits."

Q Can input or steering means be diodes?

A Yes.

MR. TONE: May I have a moment to confer?

THE COURT: Yes, why don't we take a 10-minute recess.

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(brief recess)

MR. TONE: The redirect is concluded, your Honor.

THE COURT: All right. Any recross?

MR. LYNCH: Just a little, your Honor, may it please the Court.

RECROSS EXAMINATION

BY MR. LYNCH:

Q You testified, Mr. Frederiksen, about the advantages of a microprocessor in a pinball machine.

Now, isn't it a fact that microprocessors were indeed promoted as replacing random logic? Correct?

A Yes.

Q They were promoted as replacing random logic so that you wouldn't have to redesign the machine each time, but rather could change the software and could change the function. Isn't that correct?

A No.

Q Let me refer you to the Intel manual. Do you have it before you?

At page 2 of the manual it indicates:

"When designing with random logic, logic gates, flipflops, et cetera, the designer will usually start with the description of the desired function in an attempt to wire counters, gates, et cetera, to achieve this function. Switches, displays, et cetera, are also connected to the logic. To

correct errors and make changes in a design usually requires significant changes in wiring, often requiring that the circuitboards be scrapped and replaced by new ones."

Do you see that?

A. Yes.

Q. That's what used to happen with electromechanical pinball, correct?

A. Yes.

Q. Down below --

THE COURT: I don't have the right exhibit. What's the number on that?

MR. LYNCH: I'm sorry, your Honor. I neglected to tell your Honor. It's 1-A. It's a rather thick one, your Honor -- that's it.

THE COURT: It says "Gottlieb." I thought it was a Gottlieb --

MR. LYNCH: It's a Gottlieb deposition exhibit.

THE COURT: -- Manuel. It's a Gottlieb exhibit.

Okay. Page 2?

MR. LYNCH: Page 2. It indicates -- that first full paragraph going all the way out to the margin is what I read.

THE COURT: Yes.

BY MR. LYNCH:

Q And that indicates precisely what you indicated was the condition with electromechanical pinball, correct?

A Yes.

Q When you redesigned for a new game, if you wanted to have a new point score register for any given switch, you had to rewire the machine, correct?

A Yes.

Q It indicates further down:

"To do the same design with the MCS-4 microcomputer set the designer again starts with a functional description. However, he implements these functions by encoding suitable sequences of instructions in ROM."

That's what you did. Isn't that correct?

A Yes.

Q

"The MCS-4 instruction set is quite complete and allows a wide variety of functions to be performed."

And continuing in the following paragraph it says:

"As a result of this organization almost the entire logic, the entire personality of the machine is determined by the instructions in ROM. Very significant modifications of machine characteristics can be made by changing or adding ROMS without

making any changes in the wiring or circuitboards."

Correct?

A. This is true in as far as the machine is like a microwave oven or something; this is quite a bit different in pinball.

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Q Well, you were using that same kind of changing the ROM from game to game, correct?

A Yes.

Q You could maintain the same architecture, correct?

A Yes.

Q You could by arranging things in a matrix, you could connect the matrix to the same architecture and change the character of the game, correct?

A Yes.

Q That is precisely what you did, isn't that right?

A Yes.

Q You changed the personality of the game from game to game by changing the ROM?

A Yes.

Q Now, you mentioned the playfield memory --

A Yes.

Q -- as an advantage.

Is it mentioned in your patent?

A I do not recall.

Q Is it mentioned in your patent?

A I do not recall.

Q You do not remember whether or not playfield memory feature was in your patent?

A Well, it was in the attachments, the program, of course.

Q Is it in the program?

In playing Flicker, there was no playfield memory. Are you saying there is playfield memory in the Flicker game?

A. I thought there was in the electronic Flicker.

Q. If it had playfield memory, isn't it the case that the situation or the lights on the board would restore to the same condition they were in when the ball went out and player number one finished with his first ball?

A. Yes.

Q. Then player number two would come up, and he would get a new set of lights, correct?

A. Yes.

Q. Player number one comes back to play, and he gets the lights on the playfield the way he saw them, correct?

A. Yes.

Q. Now, that is accomplished solely by software, correct?

A. Yes.

Q. It is accomplished solely by asking the microprocessor, which has a memory function, to please remember which lights are lit, microprocessor, and when we come back to one, we are going to relight them again, correct?

A. Yes.

Q. Now, in playing this game, it did not have that feature, Mr. Frederiksen?

A. In this electronic Flicker?

Q Yes.

A I have not played that game in many years. I would have to take a look. I don't know.

Q. Would you like to play it and find out, or will counsel stipulate that it does not have it?

MR. TONE: We will accept your report on having played it, Mr. Lynch.

MR. LYNCH: Mr. Goldenberg once again did this.

MR. GOLDENBERG: It is always Mr. Goldenberg.

MR. TONE: All right, I am overruled. I guess I will have to ask Mr. Lynch to proceed with what he was doing.

THE COURT: Well, the question is?

MR. LYNCH: When we played it, it did not appear to have a playfield memory. Maybe something has changed with it or something, I do not know.

MR. GOLDENBERG: Your Honor, I just played the game. It did not appear to me to have playfield memory.

THE COURT: It seems to me a very important point, not necessarily important in the case, but it is important as to the machine whether it has a playfield memory or not.

MR. SCHNAYER: Your Honor, I thought I saw it had a playfield memory. When I saw him play it, I thought I observed a playfield memory.

THE WITNESS: Well, can we play it?

THE COURT: Why don't you play it during the lunch hour.

MR. TONE: Instead of taking your Honor's time.

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THE COURT: Then we can find out.

BY MR. LYNCH:

Q. Now, at the time that you undertook this design effort, were you instructed by Mr. Nutting to make an investigation of what was available or what the status of electronics was?

A. Not specifically. He asked me to investigate building a solid state pinball machine.

Q. Did you find that microprocessors had been discussed in the trade magazines as controllers for pinball machines?

A. I recall seeing microprocessors discussed in trade magazines. I just do not recall.

Q. You do not recall whether they were or not?

A. No, I do not recall.

Q. Did you get copies of Electronics Magazine?

A. I do not recall them in those very early days. I was just new into engineering.

Q. I show you Exhibit 1-B, a copy from, I believe, a March 1974 Electronics Magazine.

It indicates here that, "Our customers are adapting the microcomputer to new applications and markets by programming ROMs instead of hardwiring logic."

Is that what you did?

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MR. TONE: Your Honor, I object to this as beyond the scope of the redirect.

MR. LYNCH: He talked about the advantages that he realized, your Honor, with using a microprocessor.

THE COURT: It seems to me that it is within the scope of the redirect.

BY MR. LYNCH:

Q. That is precisely what you did, isn't it?

A. No, precisely what I did was to not replace the random functions directly with a program microprocessor but to create a very unique architecture, which did not exist before, that I could hang the elements required for a pinball machine on.

Q. You programmed ROMs, right?

A. Yes, I did.

Q. You used those ROMs instead of hardwiring logic that existed in pinball machines, correct?

A. No, there was no multiplexing in pinball machines prior to the time that I started with them.

Q. I am not talking about multiplexing. I am just --

A. The microprocessor drives the multiplexing. If the random logic didn't drive the multiplexing, how could the microprocessor just simply replace it?

Q. I don't understand your question.

You programmed your ROMs, correct?

A. Yes, I did.

Q. In the right Flicker you have a programmed ROM, correct?

A. Yes.

Q. In the left hand Flicker you have hardwired logic, isn't that correct?

A. Yes.

Q. And this ad suggests that, "General purpose microcomputers invented two years ago by Intel have already outmoded hard-wired logic," et cetera, and suggests pinball and slot machines as a use.

A. Yes.

Q. It also indicates here that the pinball machines and slot machines, "The usage of the microcomputer makes them more fun and imaginative," isn't that correct?

A. Yes.

Q. What other play features are mentioned in your patent that you introduced to pinball?

A. I don't recall any others.

Q. Do you recall whether playfield memory was in your patent?

A. It was in the patent as far as I thought, the best of my recollection, in conjunction with the program.

Q. But it is never mentioned as such?

A. The program is very explicit.

Q. It is never mentioned in the patent, Exhibit 3, is it,

to your knowledge?

A. I am a little confused. Is the program separable from the patent?

Q. This is the patent (indicating).

A. Yes, I have a copy of that.

Q. Is it in there?

A. I don't believe so.

MR. LYNCH: No further questions, your Honor.

MR. TONE: Your Honor, I hesitate to re-redirect, but I would like to ask one question, or one item, rather. It may be more than one question.

THE COURT: All right.

REDIRECT EXAMINATION

BY MR. TONE:

Q. When you submitted your patent application, you and Mr. Nutting working with your attorney, did you submit as part of the application the program?

A. Yes.

Q. Do you know whether under the rules and practice of the Patent Office the program which is part of the patent specifications is printed with the patent when it is issued?

A. I don't know.

MR. TONE: All right, we will cover that later. Thank you, your Honor.

THE COURT: All right, thank you, Mr. Frederiksen.

You may stand down.

(Witness excused.)

THE COURT: I think rather than start another witness at this point, we will recess for lunch.

I have another matter at 2:00 o'clock. We will resume at 2:15.

We will go until 5:00 o'clock. I have another matter at 5:00 o'clock, so we will go from 2:15 to 5:00.

(The within trial was recessed until 2:15 p.m. of the same day.)

BALLY MANUFACTURING CORPORATION, a Delaware corporation,

Plaintiff/Counterdefendant,

vs.

D. GOTTLIEB & CO., a corporation, WILLIAMS ELECTRONICS, INC., a corporation, and ROCKWELL INTERNATIONAL CORPORATION,

Defendants/Counterplaintiffs.

) Docket No. 78 C 2246
) Chicago, Illinois
) January 6, 1983
) 2:35 p.m.

VOLUME IV-B
TRANSCRIPT OF PROCEEDINGS
BEFORE THE HONORABLE JOHN F. GRADY

TRANSCRIPT ORDERED BY: MR. JEROLD B. SCHNAYER
MR. MELVIN M. GOLDENBERG

APPEARANCES:

For the Plaintiff/
Counterdefendant:
MR. KATZ
MR. SCHNAYER
MR. TONE
MR. SIGEL

For the Defendants/
Counterplaintiffs:
MR. LYNCH
MR. HARDING
MR. GOLDENBERG
MR. ELLIOTT
MR. RIFKIN

Court Reporter:
LAURA M. BRENNAN
219 South Dearborn Street, Room 1918
Chicago, Illinois 60604

THE COURT: All right. Case on trial.

Thank you for waiting.

MR. GOLDENBERG: Your Honor may recall when we adjourned for the noon break there was a question about the capability of the electronic Flicker to have playfield memory.

Over the noon hour the game was played --

THE COURT: The playfield was heavily utilized?

MR. GOLDENBERG: It was, Judge, it was.

(General laughter.)

MR. GOLDENBERG: So that on at least one occasion it was played in the two-player mode, with players taking turns.

And so that we might understand what is involved here, I do have the transcript and I would like to read to the Court --

THE COURT: All right.

MR. GOLDENBERG: -- the questions and answers.

Mr. Lynch asked Mr. Frederiksen:

"Q Now, you mentioned the playfield memory--

"A Yes.

"Q -- as an advantage.

Is it mentioned in your patent?

"A I do not recall.

"Q Is it mentioned in your patent?

"A I do not recall.

"Q You do not remember whether or not play-

field memory feature was in your patent? 551

"A Well, it was in the attachments, the program, of course.

"Q Is it in the program?

In playing Flicker" -- still part of the question -- "In playing Flicker, there was no playfield memory. Are you saying there is playfield memory in the Flicker game?

"A I thought there was in the electronic Flicker.

"Q If it had playfield memory, isn't it the case that the situation or the lights on the board would restore to the same condition they were in when the ball went out and player number one finished with his first ball?

"A Yes.

"Q Then player number two would come up, and he would get a new set of lights, correct?

"A Yes.

"Q Player number one comes back to play, and he gets the lights on the playfield the way he saw them, correct?

"A Yes.

"Q Now, that is accomplished solely by software, correct?

"A Yes.

"Q It is accomplished soley by asking the microprocessor, which has a memory function, to please remember which lights are lit, microprocessor, and when we come back to one, we are going to re-light them again, correct?

"A Yes.

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"Q Now, in playing this game, it did not have that feature, Mr. Frederiksen?

"A In this electronic Flicker?

"Q Yes.

"A I have not played that game in many years. I would have to take a look. I don't know."

The game was played in the two-player mode, and it did not have that feature of playfield memory as characterized by the questions put by Mr. Lynch.

THE COURT: How does it work then in that two-player mode?

MR. GOLDENBERG: How does it work?

THE COURT: You just have to keep a mental recollection?

MR. LYNCH: Your Honor, it works the same way the electromechanical game works. The playfield may be reset, but there is no memory.

THE COURT: You would have to remember what you had?

MR. LYNCH: No, you do not. You do not get the points.

MR. GOLDENBERG: The score is recorded.

THE COURT: The score is recorded.

MR. LYNCH: The score is recorded in all of them, your Honor.

THE COURT: Well, what would look different about

the playfield the second time anyway? I am not sure I understand.

MR. LYNCH: That is what I think your Honor did not understand. Perhaps if your Honor would --

THE COURT: I mean, I would --

MR. LYNCH: Just so your Honor understands what playfield memory is, when the player number one exits, let's assume that there are four lights lit here because he has gotten up to 4,000 on the bonus, and this light and this light is lit, and this light is not lit and this light is lit.

Well, let's assume the objective is to get all the lights lit because you get more points that way.

Player one uses the first ball. Then the new ball comes up to player number two. The playfield is rearranged.

When player number two loses the ball, playfield memory would call for player number one to get all his lights lit again, the same way as when he exited the game.

MR. GOLDENBERG: He would not be starting off at ground zero.

MR. KATZ: That is the way of the electromechanical one. This was a duplicate.

MR. LYNCH: This is a duplicate of the electromechanical, and the playfield is reset according to some random idea that there is no effort to memorize the condition

of the playfield, and that was the item that the witness suggested was an advantage of the microprocessor because you have the memory, and now you are capable of memorizing it.

THE COURT: How do you reset it the way it was?

MR. LYNCH: Just randomly, your Honor. It just appears it is random, just like the electromechanical.

THE COURT: Something happeed the first time around.

MR. GOLDENBERG: Eseentially, when the ball exits, it hits a switch which clears --

MR. KATZ: It clears the players, goes back to zero, but the score is retained.

MR. GOLDENBERG: The score is retained, but it clears the light condition as created by the ball as it was exiting. It sets it back to zero.

THE COURT: What I am not sure I am understanding is whether even without the memory the electromechanical and the sold state flipper both somehow reset the playfield to the original.

MR. LYNCH: They both do.

THE COURT: My question is how do they do it?

MR. GOLDENBERG: They both do that, as I said, by the ball operating a switch, by the ball as it exits the playfield.

THE COURT: That switch has something to do with repeating that same thing?

MR. LYNCH: yes, electromechanical logic. It says logic, go to point zero.

MR. SCHNAYER: It resets everything into the initial condition.

MR. GOLDENBERG: The same happens over here.

MR. KATZ: Except it does it through a computer.

MR. GOLDENBERG: It does it through a computer.

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THE COURT: What does player number one do then when he commences his second turn in order to reproduce the original field?

MR. LYNCH: He cannot do it.

MR. TONE: On the old games he can't do it.

THE COURT: Well, that was my question.

MR. TONE: He can't do it --

THE COURT: He cannot do it, all right.

MR. LYNCH: He cannot do it on the Flicker game. It is not disclosed in the patent, and it has been implemented on some newer games today.

MR. KATZ: It was implemented on -- we will show through evidence that on next successive units, it was in fact implemented.

THE COURT: All right. Well, I didn't make my question clear. Now --

MR. KATZ: It had the --

THE COURT: -- I understand.

MR. KATZ: -- capability but wasn't used.

THE COURT: The answer is that none of the Flickers that are in the courtroom here today have any means, whether by memory or otherwise, to reproduce a former playfield.

MR. TONE: That is exactly right.

MR. LYNCH: That is exactly right.

MR. TONE: This was built, of course, attempting to

be, as the evidence indicated, as an exact duplicate of that, and that doesn't have the means of having the playfield recall.

THE COURT: All right, very good.

MR. TONE: The plaintiff calls Mr. David Nutting.

THE COURT: Let me make a note here before we swear the witness.

(Brief interruption.)

(Witness sworn.)

DAVID J. NUTTING, PLAINTIFF'S WITNESS, SWORN.

DIRECT EXAMINATION

BY MR. TONE:

Q Will you state your full name and spell your last name?

A David Judd Nutting, N-u-t-t-i-n-g.

Q Are you presently employed?

A I am presently employed by Bally Manufacturing.

Q Do you have an office or are you an officer of Bally or a division thereof?

A We are Dave Nutting Associates, a division of Bally Manufacturing.

Q What is your position at Dave Nutting Associates?

A President of Dave Nutting Associates.

Q What is the business of Dave Nutting Associates?

A We are involved in the research and development of videographic systems, basically related to coin-operated games.

Q Will you describe briefly your post-high school education, formal education?

A I attended Denison University in Ohio for two years.

After that I left and went to Pratt Institute, where I spent four years, graduated 1955 with a B.A. in Industrial Design.

Q Will you describe your employment history?

A Upon graduating from Pratt Institute, I joined the service in the Corps of Engineers as a second lieutenant, where I was an adjutant in the construction battalion.

Upon discharge from the service, I then joined Brooks Stevens Associates.

Q When were you discharged from the service?

A 1957.

Q How long were you with Brooks Stevens?

A Through, I think, approximately '68.

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Q What was the nature of your work there?

A I was involved in the design of various products, ranging with Outboard Marine, I did all of their Evinrude motors, snowmobiles, boats, and so on. With Bolins Tractors, I did all their complete line of tractors. I worked with Kerney Tractor, where we designed and developed the first computer-operated milling machine.

In that same period then we also did work with Willis Motors, where I designed the Jeep Wagoneer at that time.

Q When did you leave Brooks Stevens?

A I think it was approxiamtely the '68 time frame.

Q What did you do then?

A I had started a company called Nutting Industries while I was still with Brooks Stevens, who developed a coin-operated quiz game known as the IQ Quiz.

Q How long did Nutting Industries continue in business?

A I think it was approximately '70, '71.

Q Then while you were with that company, what happened? What did you do? What did the company do?

A Nutting Industries produced a product called the IQ Computer, which was my first entry into the coin-operated world, which happened also to be a very successful game as my first entry, which spoiled me.

We went on and developed other coin operated

products. We also had a division called Modec, which is an educational division involving the audio-visual educational area, where we developed various lines of educational equipment.

Q. Very briefly in a sentence, what was the nature of the IQ Computer game?

A. The IQ Computer game was a question and answer game, where we projected questions on the screen using film. The faster the player answered the question, the higher his score.

Q. What happened when your employment with Nutting Industries terminated?

A. In that event I started another company called MCI, known as Milwaukee Coin Industries, whereupon we entered into the manufacture of a game called Red Baron.

Q. Were there other principals or did there come to be other principals in Milwaukee Coin Industries?

A. Oh, yes.

Q. How long were you with Milwaukee Coin Industries?

A. Until June of '74.

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Q And why did you leave that organization?

A Primarily because Milwaukee Coin Industries was phasing out of the manufacturing, and the principals backing MCI requested that all engineering cease and that I depart.

Q And did you -- what happened with respect to your employment when you left Milwaukee Coin?

A I organized a company called Dave Nutting Associates. whereapon we entered into an agreement with Bally-Midway to develop games for them.

Q Have you ever done any electrical designing?

A No, I have not.

Q Tell us what your phase of the design process is.

A I'm basically a game designer; I also -- mechanical, that I become involved in the actual game concepts.

I then take the game concepts and create the cabinet for it, all the player inputs, I mean, switches, whatever.

Then I turn that over to my engineers who then attach the logic so that then it plays in the manner which I've laid it out to them to play.

Q Since 1968 what kinds of coin-operated amusement games have you designed, other than the ones you've told us about, which I guess are IQ Computer and Red Baron?

A The list is -- okay.

Q You don't need to list them exhaustively. Tell us a few.

A. The Dual IQ, the Blue Max; we went on and did Flying Ace, U-Boat; we did Desert Fox, to name a few.

Q. I show you Plaintiff's Exhibit 3, which is a copy of the reissue patent in issue in this case.

Are you the David J. Nutting listed on the patent as a co-inventor?

A. Yes, I am.

Q. When did you first come to work on the design of a coin-operated game? How long ago?

A. It would be about 1965.

Q. And that was the IQ Computer game?

A. That is correct.

Q. What kind of logic did it use?

A. It's pure electromechanical with just a slight solid state.

Q. Was a patent, or were patents issued for that game?

A. Yes, they are.

Q. and were you and another person co-inventors?

A. Yes, we were.

Q. And your part in the design of that game was generally the role that you have described generally with respect to games?

A. Yes. I designed the cabinet, the graphical interface with the players, the location of the buttons, the inputs; I design the actual chassis inside, the projector system, and

organize the means of making the actual film and the questions.

Q And who designed the electrical circuitry?

A On that game it was Harold Montgomery.

Q And he was the co-inventor?

A Yes, he was.

Q How many were manufactured and sold?

A Approximately 4,000.

Q And the seller of that game, you told us, was Nutting Industries?

A That is correct.

Q Did you also have some experience with electronic educational teaching machines?

A The Modec division of Nutting Industries was involved in educational teaching machines, yes.

Q And tell us what kinds of machines those were, very briefly.

A We had a line of products. One was called Multimode, where we had an audio-visual film and audio tape cartridge that you'd plug into the unit.

It had response buttons so that it could branch, and the operator could then learn either -- we did programs for Montgomery Ward Service, we did medical programs and things like that.

We did a series of machines for American Airlines, which we called Carols -- I think we built 20 of

them -- where we developed a system whereby the airline pilots could learn the inertial guidance system at that time for the 747's.

We went on and developed another product which we called a patient history unit, which would project questions onto a screen; the patient would enter his answer, her answer.

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The response was then interfaced into a computer, which then eventually printed out a full medical history on that patient.

Q Did you mention a game called the Puzzler?

A No. Puzzler was one of a series of the quiz games.

Q Was it electromechanical?

A It was basically an electromechanical game with minor solid state circuitry.

Q What was the solid state circuitry part of it?

A Primarily the photo recognition from the film, which would then give correctness and incorrectness, to tell which the correct answer was, and also which category.

Q There was a game called Red Baron.

What was that?

A Red Baron was a shooting game. It was a World War I theme where you are the pilot trying to shoot down the Red Baron and whereupon used the technology of film projection. I had a disk which would rotate through a projector, project an image of the World War I aircraft onto a screen, had tracer bullets, and you shoot it down, and it had all the sound effects, and so on.

Q I overlooked asking you whether you got a patent on any of the audio-visual educational machines.

A Yes. We filed various patents, yes, and had them issued.

Q Was one or more within one patent issued --

A. Yes, I believe so.

Q. -- on such devices?

When did you first think of developing a solid state pinball machine, Mr. Nutting?

A. Well, actually, it goes back to about 1968 on my first entry into the coin-operated world.

The people I dealt with at that time, mainly Gene Wagner, who was my marketing director, and one of our key distributors, John Blahata, would keep telling me in our meetings or suggesting that, "Hey, Dave, if you are for real in this business, you have to find a main line product staying-- like a computer-type game", which they classified as a novelty piece, that we would have cash flow problems. Well, it, in fact, did happen.

So that first inkling of trying to achieve and find this ultimate goal of getting into pinballs started at that time. What I needed was an edge. I couldn't compete with a Williams or with a Gottlieb on their terms. I needed something different. So I was looking for the difference in the area of electronic advancement, some kind of advancement technology.

Q. I show you a document marked Plaintiff's Exhibit 37, and I ask whether this was a document, a letter, that you wrote in your capacity as an officer of the Nutting Industries, Ltd.?

A. Yes, I did. It is a letter to Gene Wagner, whom I just mentioned was our marketing manager of Nutting Industries.

Q. Did you write the letter on or about the date it bears?

A. Yes, I did.

Q. Will you read the next to the last paragraph of the letter beginning, "Our new approach"?

A. "Our new approach to service-free device of solid state circuitry could be the very backbone to our place in the coin-operated industry. This would be a major breakthrough even to solid state pinball machines."

Q. Why did you mention pinball machines?

A. Well, as I just mentioned in that Gene Wagner and John Blahuta had been advising me that we should get into the pinball business in order to stabilize our business at Nutting Industries, to give us a cash flow that we could sustain with.

Q. When you first formed Milwaukee Coin Industries in 1972, what was its first product?

A. The first product was the Red Baron.

Q. Was it a new version of the Red Baron or the original Red Baron?

A. No. It was the new version of the Red Baron from Nutting Industries.

Q. Was it still electromechanical?

A. It was basically electromechanical. We added solid state sounds at that time and made some changes in the cabinet and cosmetics.

Q. Did you at Milwaukee Coin eventually become involved in the development of a pinball game?

A. Yes, we did.

Q. Did you have any ideas about how you could get into the pinball machine business?

A. The approach I was looking for was a logic system which would be beyond the current electromechanical state of the art that the other manufacturers were using at

the time.

So I began to investigate and take some of the technology we had from Modec, which we used some solid state devices there, and, also, I became aware that new solid state devices were coming on the market.

I had our engineers take one of our games and to see if they could make a solid state circuit on that which would emulate a pinball machine.

Q. What game was that?

A. That game was Air Ball.

Q. Tell us briefly how Air Ball worked.

A. Okay. Air Ball to me was like a three-dimensional pinball. It was a game whereby it had a ping-pong ball on the end of a column of air, and the player would manipulate the ball in both the X, Y, and Z access and take this ball through a series of targets which would then gain points, and depending on what route he took or what series of targets, like on a pinball, you would build up special bonus points.

Q. You told us that you directed that some kind of solid state logic be used for Air Ball.

What kind was it? What kind was used?

A. The Air Ball game was first developed as electro-mechanical, which we had up and working as a game. At that time then I had my engineers then take the game as

it was played and made a full solid state logic system for it.

Q. Was Air Ball similar to pinball with respect to its components, or was it different?

A. Air Ball to me was the same thing as a pinball in that it comprised of lamps, switches, digits, and also solenoids, which are the same components you will find on a pinball.

Q. Who worked on that Air Ball project?

A. I believe Duane Knudtson did that project.

Q. When did he do it?

A. That would be in the latter part of '73. That would be the August-September time frame of '73.

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Q What was the result of your attempt to use random logic in the Air Ball?

A The design that Duane had evolved, the game played fine, worked fine, but then all of a sudden, it would go into what we call flake mode. It became very unstable.

Q You went into what? How did you describe that state?

A Go into Never-Never Land. The game was unstable and not satisfactory for production. So we went into production with the original electromechanical version.

Q Calling your attention to the fall of 1973, did Milwaukee Coin hire Jeffrey Frederiksen at that time?

A Yes. Jeff had been working with me in the summer as a consultant. I hired him full time in October of '73.

MR. TONE: Would your Honor allow me to confer for a minute?

THE COURT: Yes.

(Brief off the record discussion.)

BY MR. TONE:

Q One more question on the Air Ball game.

Did it have targets, solid targets, that were struck by this ping-pong ball that floated on a column of air?

A No. The ball actually moved through the targets. It was like a loop. The ball would move through, and it was sensed by optical sensors.

Q. After Mr. Frederiksen arrived as a full time employee, which was in late October --

A. Of '73, yes.

Q. Did you and he and others from Milwaukee Coin attend a trade show?

A. Yes, the AMOA or MOA just at that time.

Q. Approximately when was this?

A. That would have been in late October.

Q. Of 1973?

A. '73.

Q. Were there any micro-controlled pinball machines shown at the show?

A. Not that I was aware of, no.

Q. After the show, did you have any discussions with Mr. Frederiksen about what you had seen at the show or what subjects were raised in your minds by the show?

A. Yes, we would use the AMOA show as kind of like our report card in that we would assess what we had done for the year, and then we would look forward to the next 12 months in terms of projects to be achieved.

Q. Directing your attention to the subject of solid state controlled pinball machines, did you have a discussion with Mr. Frederiksen on that subject at about that time?

A. Yes, I did.

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did

Q. Where did it take place, and who was present?

A. Well, it took place in our conference room on Holton Avenue, and it was basically my staff of engineers and game developers.

Q. Would you state the substance of that discussion?

A. Well, specifically to Jeff, I told him that we were -- I wanted him to continue and complete the Safe game logic he was working on.

I wanted him to continue in his investigation of microprocessors, particularly in the area of pinball, that I wanted to get this project going, that I mentioned that we were -- I also had a desire to do a Super IQ game.

That is about the conversation I had with Jeff.

Q. You spoke of a Safe game.

We heard something about that from Mr. Frederiksen. So we do not need too much detail.

But he was working on that at the time?

A. Yes, he was.

Q. Was anything more said about your plans or views with respect to the desirability of developing a solid state pinball game?

A. Well, I explained that Jeff had just joined the firm. So I was educating Jeff in the way of the coin world, and having gone through Nutting Industries where we had the

ups and downs of novelty games -- some we made and some we had lost money, and eventually went out of business -- that what we needed was a stabilized product. What it was seeking to do was to get into the pinball business taking advantage of the -- some edge in technology.

Q Do you know what Mr. Frederiksen did after that with respect to pinball machines?

A He continued in his quest for knowledge on microprocessors. He gathered all the information he could, written.

He made contacts with the manufacturers at that time who were in the area of development of microprocessors.

Primarily those names were National, Fairchild, and Intel, that he made contacts with the local reps, because I could see the stacks of manuals growing on his desk.

He also then started playing around with different kinds of circuitry. He started talking to me about muxing or what he called about matrixes. Then he started talking about multiplexing.

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Q. Before we come to that: while he was talking to microprocessor companies and assembling information on microprocessors, did he, to your knowledge, also consider any other logic systems for possible use with an electronic pinball game?

A. Well, he was considering -- I was pushing for him to get in to look at the microprocessors.

Jeff's background was, having done the Safe game, and so on, he had felt a lot more confident with solid state or random logic.

And so he was -- I think he was thinking more in random logic at that point, where I was thinking -- I felt that the microprocessor, from a game designer's standpoint, was the answer I was looking for.

Q. In the early stages of the consideration of an electronic pinball game did you have any conversation or conversations with Mr. Frederiksen on the subject of the components of pinball games?

A. Yes. Jeff was -- during this period, then I had to get Jeff up to speed as to what a pinball game was.

And I brought into the plant a pinball game I had at home. This was the Flying Carpet game. That we went through the game, and I explained to Jeff that the pinball is basically made up of lamps, switches, digits, and solenoids. And somehow you have to combine

those into a logic system whereby then I, as a game designer, can now manipulate and make a pinball -- interact a pinball game out of it.

Q. Did you arrive at some numbers for the various components of a pinball game in these discussions?

A. Yes. Jeff would keep asking me, "What if -- I mean, how many do we need? How many do we need of that?"

He kept talking binary numbers.

I investigated and did my research in terms of games that had been built. And we fluctuated all the way, as high as 128 components down to 32, and so on.

We finally arrived at a combination of 64 lamps, 64 switches and 16 digits and 16 solenoids; the 16 digits representing a two-player pinball machine.

Q. Did you discuss with him how the machine -- how a pinball machine operated during those discussions?

A. Oh, yes, that's why I brought the machine in, the Flying Carpet in, so he could understand what it is and how this ball rolls around, and get a feel of the timing involved.

Q. When did Mr. Frederiksen complete the design of the Safe game, as you recall?

A. That would have been late November of '73.

Q. What form of logic did that game use?

A. That was random logic. Excuse me.

That was random logic.

Q. Very briefly -- I don't think --

MR. TONE: I think your Honor will recall the Safe game. I'll skip the description. We had it from Mr. Frederiksen.

BY MR. TONE:

Q. What do you mean by the term random logic?

A. Well, it's basically a logic circuit that is dedicated for a specific end use, specific logic, predetermined logic.

Q. Calling your attention to early December 1973, did there come a time when you had a discussion with Mr. Frederiksen on the subject of his idea for developing a solid state pinball game and a discussion at the blackboard?

A. Yes. Jeff, in on-off discussions, had been mumbling -- or, I shouldn't say mumbling -- but he'd been expressing this term multiplexing, expressing this term matrix.

And in early December he took me to the blackboard and said, "Hey, here's what I mean by multiplexing and matrixing." So he drew this matrix on the board. And then he was telling me how he was going to mux these lines, multiplex these lines.

Q. And he drew these ideas on the blackboard?

A. Yes. Jeff loved to use the blackboard as his base

of expression.

Q. I hand you Plaintiff's Exhibit 7.

MR. TONE: Your Honor received a copy of that during the deposition of Mr. Frederiksen, and it has been admitted in evidence.

BY MR. TONE:

Q. Do you recognize the drawing on Plaintiff's Exhibit 7?

A. Yes, I do.

Q. And what do you recognize it as?

A. It's -- it appears to be the reproduction of a sketch that Jeff made on the blackboard.

Q. And does this appear to you to be an accurate representation of the matrix that Mr. Frederiksen drew at that time?

A. Yes, I believe it is.

Q. Did Mr. Frederiksen indicate in that discussion what kind of system would control the stroking of the matrix -- the strobing of the matrix?

A. I don't recall -- well, he -- well, not at that time, I don't believe I recall that he had a specific logic system in mind.

Q Did you subsequent to that in December have another discussion with Mr. Frederiksen on substantially the same subject?

A Yes, I did.

Q How much later than the first discussion?

A It was shortly thereafter, within a week or maybe two weeks at the most.

Q Tell us what was said at that time.

A Basically Jeff was very excited about something, and as soon as he could find me, he grabbed me and pulled me into the conference room and indicated that he thought he might have this ultimate answer that I was looking for.

He proceeded then to -- no, I guess the drawing was already on the blackboard. Then he described to me this drawing that was on the blackboard.

Q I hand you a copy of Plaintiff's Exhibit 8, which has been received in evidence, and I ask you whether you recognize it?

A Yes, I do.

Q What do you recognize it as?

A This is a representation or a copy and fair representation of the drawing that Jeff had on the blackboard at that time.

Q What did Mr. Frederiksen say, if anything, about the drawing on the blackboard?

A He said, "Dave, I think we can do it. I think we can

hook a microprocessor up to my multiplexing mux system."

Q Did he say what made him think that?

A He said he had just had a meeting with the Intel rep and that the representative from the factory had been with him and that after discussions with the Intel people, that he arrived at the conclusion that yes, we can do this.

Q Do you recognize any part of Plaintiff's Exhibit 8 as having received particular attention in the discussion you had with Mr. Frederiksen that day?

A In that he added the block on the left that is the logic, control logic system?

Q Was there a discussion about that?

A Then Jeff went on to explain that not only does it look like the 4004 is going to work in the system, but also Intel has available a complete simulator development system available that we could purchase supposedly off the shelf.

Q What did you say in response to Mr. Frederiksen, if anything, in this meeting?

A I, of course, myself adrenalin started to go because it appeared, it sounded like, and felt like and so on that we were there, that this is what I had been looking for; but, on the other hand, I had great reservations because this was a giant step in my mental gymnastics.

Q Can you describe more specifically the nature of your reservations?

A. Well, coming from the world of electromechanical, where we think in time frames of tenths of seconds in terms of relays, closing, picking up, stepping switches, and so on, that is kind of a real world that is easy to grasp and play with.

Now all of a sudden Jeff is throwing me into this world where a microprocessor runs and now he talks about milliseconds in probably the same breath, and I was just -- I mean, I couldn't get up with it.

I said, "Jeff, it sounds like it could -- how are you going to interface a pinball machine, which runs in like tenths of a second, and you are going to run this microprocessor out in multi --"

Well, he talked about milliseconds. I said, "How are you going to get these two worlds together so they can talk to each other?" I said, "You are going to take a rollover switch, where the ball could take a whole second to get over to the rollover switch, and you are talking about maybe running this thing at 60 cycles or something. To me that means you are going to read that switch 60 times. I want a score of 100, and instead I am going to get a score of 10,000 or something."

I also questioned the lamps. I said, "Okay, you are going to mux these lamps, or multiplex these lamps. To me you are going to turn them on and off. To me that

means they are going to flicker. They will just light up the playfield like a flickering Christmas tree."

So Jeff heard my reservations and went back to his lab and appeared about a week later and said -- I guess now we are about into January, where he said, "Dave, hey, I've got something to show you"; whereupon -- well, Jeff was pushing for me to release to get this development system.

7-2

system1 Q You hadn't mentioned, I think, the development system. Do you recall the name of it?

A Well, we called it the Intellec or 4004 development system.

Q Do you recall how much that would cost?

A Jeff told me it would be around $3,000.

Q All right, go ahead with your account.

A Jeff was pushing for me to release the PO for this development system so --

Q PO being purchase order?

A Purchase order.

So that to convince me, he pulled me in the lab and said, "Hey, Dave, lookit. I want to show you something."

So what he presented to me was a fixture which had eight light bulbs on it and had eight glowing lights.

I said, "That's nice, Jeff. You're a great genius. I can also light eight lights."

Of course, he had a big smile on his face, and then he tweeked the pot and all of a sudden then you could start to see the dump, bump, bump, bump, the lights cycling.

So then we played around and went up and down in terms of the cycle. At what rate does the eye stop seeing the flicker?

At that point then I was pretty well convinced and said, "Jeff, what about the switches?"

He said, "Oh, don't -- I'll take care of that one in software."

So I said, "Okay, let's go order the machine."

Q We had the replica of that demonstration in the courtroom, and here it is.

No, I can't find it. I won't take the time to look for it, your Honor. I think we all remember it.

When did you order the Intellec 4? Do you recall?

A It would have been that first week or second week in January,'7 --

Q 197 --

A '4.

Q When was the Intellec 4 delivered to Dave Nutting -- well, at that time it was Milwaukee Coin?

A I believe it was in the April time frame.

Q How was it paid for?

A It was paid by a check, I believe.

Q This is Plaintiff's Exhibit 325. Do you recognize that?

A Yes, that is the check for the payment of the Intellec 4004.

Q That is to say, it is a reproduction of that check?

A Yes, it is.

MR. TONE: May I hand that up, your Honor?

BY MR. TONE:

Q. Who signed that check?

A. That was Dan Winter, who was --

Q. Who was Dan Winter?

A. He was president of MCI at the time.

Q. Now, in that time period did you do anything with respect to a game called Super IQ Computer?

A. Yes, we had under development a game called Super IQ Computer. I had asked Jeff to design a solid state logic system for it, and at the same time he was working on the microprocessor pinball.

Q. Was the Super IQ Computer a descendant of the IQ Computer game you had built in the late '60's.

A. Well, you could call it a descendant, yes.

7-3

Q Wherein did it differ?

A The basic game play was going to be similar. I was asking Jeff to do a solid state logic system for it.

Q By solid state, what do you mean? Can you be more specific?

A Well, a random logic, similar to the Safe game.

Q Did you have a discussion with Mr. Frederiksen during that period about the kind of logic that would be used in the Super IQ game?

A As the project progressed, Jeff finally came to me and said, "Dave, you've got to have one or the other. You can't have the solid state running the Super IQ and have the microprocessor pinball design done at the same time."

He suggested that I make a choice, either run ahead with the solid state and drop the pinball project, or take the pinball project and interface it into the Super IQ game, to which I chose, "Okay, let's take the pinball project and let's use the Super IQ as a vehicle to then test out all your theories."

Q In what respect or how would the Super IQ operate as a vehicle to test out Jeff's theories?

A It was made up of switches. It had a lot of lamp switches. It had motor controls, which would be like solenoids. It had digits, which were required for scores.

So it had the same components.

Q Did you complete the development of the Super IQ?

A Yes, we did. We developed it to an operational state using the 4004 system.

Q Did you demonstrate it to anybody?

A We demonstrated it to the Bally people in, I think it was, June of '74.

Q What was the control system for the Super IQ at the time you demonstrated it to Bally?

A At the time we demonstrated it to Bally, we had it hooked up to the Intellec 4004 system, the blue box.

Q Was that the system that is represented by that blue box we have seen in the courtroom?

A Yes, what became known as the blue box.

Q Which is now identified as Defendants' Exhibit GD-104?

MR. GOLDENBERG: No; no, sir, that was when it was identified as a deposition exhibit.

MR. TONE: Can you help me with the numbering?

MR. GOLDENBERG: I was coming over to do that, sir.

If you will bear with us just a moment, we will have it and we will put the proper label on it.

MR. TONE: All right.

MR. LYNCH: 13-B.

MR. GOLDENBERG: 13-B.

MR. TONE: Defendants' Exhibit 13-B, your Honor.

BY MR. TONE:

Q Was that Intellec 4 in the cabinet of the Super IQ or exterior to the cabinet of the Super IQ?

A The best that I can recall, I think we stuffed it in the bottom.

Q I am sorry?

A The best that I can recall, I think we put the whole unit in the bottom of the cabinet of the IQ Computer, sir.

7x

Q You think that the Super -- you think that the Intellec 4 was in the cabinet?

A The best -- well, that's what I believe I remember.

Q All right. What was the reaction of the Bally people to whom you demonstrated the Super IQ?

A It was not overly enthusiastic.

Q Well, can you be more specific?

A They basically did not think the game, as a game, the Super IQ would be marketable, and they basically turned it down.

Of course, Jeff and I were excited about the fact that it was operating under a microprocessor. And we tried to get the point across to Joe Robbins, and, I think, Hank Ross; this whole new breakthrough in technology that we were showing them. They had no idea what we were showing them.

Q And what happened to the project at that point?

A The Super IQ project basically, if marketing from Bally considered it not marketable, and we just abandoned it at that point.

Q The project was terminated?

A The Super IQ as a game, yes.

Q How long after demonstrating it to the Bally people was it terminated, was the project terminated?

A Well, probably immediately. I mean, just right then.

Q Now, during the time that the Super IQ was being developed, were you doing any development work that related to an electronically controlled pinball game?

A Yes. I was -- in order to get a, to make a pinball game, one of the missing elements currently available were digits; that we did not want to go with the standard reel type digits, we wanted to go with large, incandescent, or some kind of 7-segment, what we call readouts.

And the state of the art at that time, the -- we called LEDs were very small, they were like 3/8ths of an inch.

The larger incandescent segments that I uncovered various manufacturers, were extremely expensive, and were not practical to put into a production pinball.

That I then began the development of proprietary type of readout for, just for pinball.

Q And during what time period did this take place, the work you've just described?

A It was an ongoing project. It started in January/February time frame and then I actually -- we actually had them running on the Super IQ on the demonstration in June.

Q Calling your attention to the period in early 1974 before the Intellec 4 arrived, did you do any work on the Flying Carpet pinball machine that you testified you had on the premises?

A Yes, we did. We kind of used it as an educational vehicle for engineering people working on it.

And what we did, what I had Jeff do, and the technicians, was to then actually measure the various times, particularly on the switches, like how long would it take to activate a target switch, how long would it take to activate rollovers, how long do we have to leave solenoids on to get the proper ballplay we need, and so on.

So they -- what they did is actually take a scope and put on to each one of these elements and get a timing, kind of a window as to the maximum/minimum required on these various elements.

Q You told us that you left Milwaukee Coin in late June of 1974 and formed Dave Nutting Associates.

Was that before or after the demonstration to Bally?

A That was after the demonstration to Bally. Bally, I think, was in the third week of June; and we left MCI the end of that month, 30 or 31st of June.

Q And then Dave Nutting Associates was immediately formed and you moved into new premises located where?

A We moved into a building on Keefe Street, which is the building that I had owned, and moved into the rear area. The front part was the Red Baron Game Room operation.

THE COURT: Mr. Tone, let me interrupt, if I may,

for about a five-minute recess.

MR. TONE: Very well, your Honor.

(Brief recess.)

BY MR. TONE:

Q How did Dave Nutting Associates get the financing to begin operations?

A We entered into an oral agreement with Bally Manufacturing to design and develop coin-operated games.

Q Did you receive some subsidy as a result of that or some funds to operate with?

A We arrived at a basic monthly budget that they would support basically myself, Jeff, one technician, plus certain expenses.

We also then purchased equipment, certain assets from MCI, that we required or needed to develop games.

Q Including the Intellec 4?

A The Intellec 4 was part of that purchase of equipment along with saws and desks and drill presses and things like that.

Q After the formation of David Nutting Associates and your move into the premises to be occupied by that firm, what work did you do on the pinball project?

A We immediately started on the pinball project.

In fact, after the meeting with the Bally people in June, I asked Joe Robbins if he would send me a pinball and that --

Q Before you go on, who was Joe Robbins?

A Joe Robbins was Empire Distributing -- a major partner in that firm.

Q Was Empire Distributing affiliated with Bally?

A Empire Distributing was also a division of Bally Manufacturing.

Q I neglected to ask you who else attended the Super IQ demonstration.

Did Mr. Robbins attend?

A It was basically Joe Robbins, Hank Ross and I believe Adey Wolvertin. I am not sure of that.

Q Were they affiliated with Bally or one of its divisions?

A Yes. Hank Ross was associated with Midway Manufacturing.

Q You asked Mr. Robbins to send you two pinball machines?

A In a meeting in June I asked him to send me a pinball. Once we got organized in Keefe Street, I called Joe and said, "Could you send me two of the latest Bally pinball machines," whereby I could tear one apart and keep one in its original form.

Q Did you get those right away, or did you have to wait a while for it?

A I thought by calling Joe, who had all the clout, that they would be on the truck the next day, but, unfortunately, it took about three weeks.

Q What did you do while you were waiting for the delivery of these pinball machines?

A Jeff was pretty antsy to get going. He wanted to start programming. So he asked me to build him a simulator, which I did.

Q What is a simulator, very briefly? Mr. Frederiksen described it, but just give us a sentence or two.

A It is basically -- he asked me to make a matrix of lamps. We actually did the 128 lamps. We had 64 switches.

In front of the lamps it was like an egg crate where we put a translucent panel to which then we could write on the panels in terms of describing what each lamp did, what function it was going to perform as in the pinball.

We also had digits on the top part of it, and we then interfaced this into the Intellec, which then interfaced into the teletype machine.

Q Was anything else done during that period?

A The --

Q Did you do anything else in connection with the pin-

ball project during that period before the electromechanical games arrived from Bally?

A Well, basically built a simulator and helped Jeff in the development of the circuitry and so on.

Q When did you receive the machines from Bally?

A It was late July, early August time frame approximately.

Q Referring to the two games standing in the courtroom, 332 and 333, do you recognize those machines?

A I recognize those machines. Those are the ones we have had on our premises ever since the -- at least I have had control of ever since that day we received them.

Q And they were under your control before they were brought here in the courtroom the other day?

A Yes, they were.

Q I show you Exhibit 29, Mr. Nutting, which purports to be an invoice for two Bally Flickers and some handwritten data on two sheets attached thereto. Do you recognize it?

A Yes. That's an invoice for the two Flickers.

Q It bears the date August 20, 1974. Do you note that?

A Yes.

Q You testified that the Flickers were delivered somewhat earlier than that.

A That's correct.

Q Do you have any explanation for the reason that the invoice is dated August 20 and the machines were, as you recall, delivered earlier?

A No, other than the machines were supposed to be on memo billing. They weren't supposed to invoice us at all.

So I was surprised that they even sent the invoice.

THE COURT: Memo billing means what?

THE WITNESS: A memo. Memo billing. No charge.

THE COURT: No charge.

I once worked for somebody who meant something entirely different by memo billing. That's why I wondered what you meant by it.

BY MR. TONE:

Q What did you and Mr. Frederiksen do when you received the two Flickers from Bally?

A We obviously immediately unpacked them and set them up.

I then took one of the units and then completely gutted it of all its harnessing, electromechanical components, and stripped it down to just the playfield and the cabinetry.

We of course then took the other pinball and played it and played it and played it until we completely understood the basic play and the game logic.

Q I show you an exhibit marked 26, Plaintiff's 26-B, which is a Xerox copy of a photograph.

MR. TONE: I think we could find the photograph, your Honor, but I haven't been able to --

It's among the originals, I've been told. We identified it with Mr. Frederiksen.

THE COURT: I've got it here. Do you want to re-examine it?

MR. TONE: No, I don't need anything. Thank you.

BY MR. TONE:

Q Do you recognize the photograph?

A Yes, I do, because I took it myself.

Q What does it depict?

A It shows all the components that I removed from the one Flicker, all the electromechanical parts.

Q Other than taking apart one of the Flickers and taking out its insides and playing the other one that was left intact what did you and Mr. Frederiksen do with respect to the Flickers?

A Just continued on in designing the basic hardware, the schematics. He began building the actual logic system for the microprocessor; that he had established a schematic whereby we divided the basic logic system separate from the I/O, so that we proceeded -- then I proceeded to move ahead and have the I/O card laid out for a printed circuitboard.

I then --

Q Did you -- go ahead.

A I then began developing what we called mux charts, that is, assigning locations in the mux system for the lamps and switches.

Q Is mux, m-u-x, an abbreviation for multiplexing?

A Yes.

Q Or an acronym for multiplexing?

A Yes.

Q And what did you -- did you and he work together on the mux charts, did you say?

A Yes. He and I worked together to optimize on the one hand the wiring and on the other hand the game play in terms of, if eventually a switch got hung up it wouldn't shut down the whole machine.

And we went through those kind of exercises.

Q What did you do after you worked out the mux chart?

A I then proceeded along with Paul Smith, we completely wired the playfield and the cabinet and completed that segment of the design.

Q What if anything was done with respect to the circuitry at this point?

A Then we had the -- Dave Stewart, who had been doing layouts for us, came in and laid out the, what we refer to as the I/O segment of the system, which was a PC board, which we then had built at Midway for us.

Q You said he came in and did the layouts. Can you be more concrete and specific about that?

A We actually make tape layouts of a PC board. It's a double-sided board. Whereby you lay out the actual circuit on both sides, and then --

Q Who designed the circuit, or determined what the, what its arrangement should be?

A Jeff did that.

Q Jeff Frederiksen.

And this person who you said came in and laid out these boards, what did he do?

A He physically, what we call tape and paste, to take Jeff's schematic -- I established the size of the board, where I wanted the digits; he then took that basic input and then

physically laid out the PC board in terms of all its circuitry.

Q. What if anything did you do with the PC board? And PC stands for --

A. Printed circuitboard.

Q. What if anything did you do with the printed circuit-board after it was laid out?

A. We then used Midway's production facilities, because we were rushing along pretty fast here.

And to get a fast turnaround on a PC board in Milwaukee, it was several weeks, where we wanted to do it over night.

So we went down to Midway and had them do it within about two days.

T11

Q What happened then?

A Well, now we are in about the end of August -- well, about the third week in August time frame of '74. We then began to bring up the various parts of the system. In other words, you know, we started plugging it in.

Q What was Mr. Frederiksen doing during this period?

A Jeff was finishing up the logic system, which he was wire wrapping. He was then also doing the software programming of the game encoding itself.

Q I am sure we all understand what you mean, but when you say Jeff, do you mean Mr. Frederiksen, for the record?

A Yes, Mr. Frederiksen.

Q What then was done with respect to this development of the electronic pinball machine?

A We proceeded then to bring up each system. Obviously we would plug in the 110 and check out all the wiring on the playfield. We then --

Q Did you say you plugged in the 110?

A We plugged into 110 volts, brought the 110 into the system and started to bring it up.

So we checked power supplies first, then checked to see if our wiring was correct, and obviously it wasn't. We had to make changes.

So you just bring it up one step at a time. The final step was the final plugging in of the logic card

which had the microprocessor on it.

Q After that what happened?

A Then we went through the debugging stage, which actually went pretty fast. In only a matter of a couple of days we actually had the machine fully operational.

Q Did you use a test program?

A Yes, Jeff had developed a test program which would exercise all the various components. It was just an automatic loop that he had developed in the software so it would exercise all the lamps and all the solenoids and make the noise maker, the solenoids hitting the gongs in the back, the noise.

Q Did you use the test program before or after you interfaced the 4004 simulator in the pinball?

A Well, it was a phase-in. At that point we still had what we called an umbilical cord attached to the logic card. So we were still developing and tweeking the actual game software at that point.

Q Did you at some point work on problems of timing?

A Oh, yes, once the game was fully -- once the system was fully operational, then it became the game design or the actual game play, and our objective was to have the mechanical Flicker and the microprocessor Flicker play exactly alike. In other words, we wanted for presentation to Bally management the microprocessor-driven pinball to

play alike, smell alike, feel alike, just we wanted it to be exactly the same so that they couldn't make any dissociation between the two in terms of its game play.

Q You heard the discussion in the courtroom before you got on the stand. I think you were in the room when there was a discussion about whether the electronic Flicker had playfield recall.

Were you here when that discussion occurred?

A Yes, I was.

Q Did you yourself have any recollection before hearing that discussion about whether the electronic Flicker had playfield recall?

A Well, no, there was no question because the objective was to have the two machines, the microprocessor machine play exactly like the other Flicker.

Even though we had the capability of putting the playfield memory in, I did not want to confuse management by -- I mean, it was a big enough step just to get them at that point. Now I am going to show them a whole new world of features?

I wanted to get them one step at a time.

1,1cbLB

Q. During the period after you -- now, let's see. Where are we in the machine? Is the machine free standing at this point in your narrative?

A. The machine is still hooked up to the Intellec. The systems are fully operational. We are now in the state of tweaking, tuning the game as a game.

Q. But you are still hooked up to the Intellec 4?

A. Yes.

Q. Which is external to the pinball machine?

A. That is correct.

Q. What happened next in the stage of development?

A. We then got the two games to play alike, or I should say the microprocessor game to play exactly like the electromechanical version.

At that time then we did what we call cut the umbilical cord. We took the Intellec 4004 off the system and then replaced the -- put it on its own circuit, so it could run on its own internal systems.

Q. What then did you do with the machine?

A. We obviously played it a lot, but because of our history with Safe where we had noise problems and other -- and, of course, my own knowledge of the industry and past experience of noise problems; we then tested the circuitry for what we call electrical noise. We took drill presses and turned it on. We actually took a hand drill and put it

on top of the unit.

I created about as much noise as I could to create like a bowling alley atmosphere where you have got all these things that can create noise and send logic into orbit.

The eventual test was when we tested it for static. We had a little test picture that we had for the Safe game, which was a Vandegraaf generator which would generate --

Q. Spell it out for the reporter.

A. Vandegraaf.

Q. Grammatically, V-a-n-d-e-g-r-a-a-f.

A. That could, you know, send a spark up to six inches.

So then we went around the machine and all the metal parts, the siderails, and this and that, and attempted to have the machine fail with the spark, and it would not fail.

Q. Had you previously, did you say, experienced noise problems with other games?

A. Yes. We had noise problems with the Safe, and there was some last-minute panic as we were going into production that Jeff had to do some quick modifications to suppress the noise problems that we had with that system.

Q. Did you say that the Safe had solid state devices in it?

1,3cbLB

A. The Safe was a complete solid state or random logic system.

Q. When was the hardware and software of the Flicker operational?

I guess that takes us back a little in your story. Can you give us an approximate time?

A. The system was fully operational in about the first week in September. We then brought up the game to be fully operational in about the -- oh, about a week later.

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Q Then you had it unplugged and self-contained about when?

A That same period about -- it would have been the second and third week in September of '74.

Q Did you ever demonstrate that Flicker?

A Yes, we did. We demonstrated it in -- I think it was September 26th.

Q Up to the time you demonstrated it, did you do any further work on the machine?

A Well, obviously getting ready for the meeting, Jeff and I just played it and played it and played it constantly to make sure that it was not going to break down at the demonstration.

Q Where did the demonstration take place?

A The demonstration took place at our facilities on Keefe Avenue.

Q Who was present at the demonstration?

A From Bally, John Britz, Inga Telnaes, Frank Bracha, and Dan Conroy attended the demonstration.

Q I show you a document marked Plaintiff's Exhibit 32 and ask you whether you recognize it.

A Yes, I do, because I prepared it.

Q When did you prepare it?

A It would have been the -- well, actually right up to the last minute.

Q The last minute before what?

A Before the meeting.

Q On September 26th?

A On September 26th.

Q I notice that the first page of the text at the bottom bears a date, 9-25-24.

I am referring to the first page of the text.

Do you see that?

A Yes, I do.

Q I notice that the cover, which is on the letterhead of Dave Nutting Associates, and labeled, "Bally Brain System 1611," bears a date, 26 September 1975, 1975?

A Right.

Q Now, can you explain why those dates are different?

A I prepared the front page using a press type. It is a type that you press on. It comes off the back and then onto a piece of paper. And in my nervousness, I must have pressed down a five instead of a four because we know the date is actually 1974.

Q When did you do that press type printing of the cover?

A Well, it was the day before.

Q That date was?

A The 25th.

Q Of?

A Of September 1974.

Q For what purpose was this brochure prepared?

A. It was prepared for the meeting with the Bally management people.

Q. What, if anything, did you do with copies of the brochure after it was prepared?

A. Well, I gave it out to the people who attended the meeting.

Q. At the meeting, did you have the two Flicker machines?

A. Yes, we did. We had obviously cleaned up the shop and had the two Flickers freestanding out in the middle.

Our area happened to have concrete floors, so that I wanted to make sure that there was nothing near the units that conveyed that maybe we have got some secret box, so that we had them freestanding out in the middle of the floor.

Q. Tell us about the demonstration.

A. The Bally group came, and we had the two side by side, and we said: Okay, tell us which is the microprocessor one and which is the mechanical one, and played the game. So they proceeded to play the games, primarily Bracha and and Conroy.

They went back and forth, one to the other. They finally recognized that one had digits and the other had the readout or the drums. So then they recognized -- they felt they knew which was the microprocessor-driven one. But from the feel of the game, they could not see any difference.

Q How did the electronic Flicker perform?

A It performed, oh, magnificently. It didn't break down. It did its thing.

Q Did you show the Bally people the interiors of the machines?

A Yes, as Bracha and Conroy were playing the machine, I had noticed Britz was wandering around, and at one point I said, "John, let me show you something."

So we opened the door, and they looked in and here is this big void, nothing in there.

In the meantime John was looking around, and I said, "John, what are you looking for?"

He said, "I'm looking for the cord that goes to the big box somewhere."

I said, "No, it's all here, John."

So he went around to the back and took the door off. I said, "Here it is, just one PC board, which is the one you see right there."

THE COURT: Something that isn't clear to me is whether you needed to plug these machines into an outlet someplace for an external source of electricity.

THE WITNESS: Oh, yes.

THE COURT: You said they were freestanding in the middle of the room. You had a socket --

THE WITNESS: We had an extension cord.

THE COURT: Extension cord, all right.

THE WITNESS: Yes.

BY MR. TONE:

Q To the AC outlet?

A To the AC outlet.

THE COURT: There were no batteries?

THE WITNESS: No, no.

BY MR. TONE:

Q Was an explanation given at the demonstration of how the microprocessor-driven pinball machine worked?

A It appeared that they were very positive as to what they saw, and Mr. Bracha, who is the engineer, and Telnais, who is an ex-IBM person, began quizzing Jeff as to how the machine operated.

Then John Britz and I retired to another part of the building, to which then Jeff continued on with his conversations.

Q Jeff was talking to whom, to Mr. Bracha and anyone else about how the machine operated?

A And to Inge Telnais and, well, Dan Conroy was there also.

Q Was Mr. Conroy with Mr. Bracha and Mr. Telnais, or was he with you and Mr. Britz?

A No, he was with Jeff and that group.

Q At least he wasn't with you and Mr. Britz when you

were talking business?

A No, he was not.

Q What did Bally do after the demonstration with respect to the electronic pinball machine you had developed?

THE COURT: Before you answer that, may I take just a moment here?

MR. TONE: Surely.

(Brief interruption.)

THE COURT: Thank you.

BY MR. TONE:

Q I will go on with another question.

Did you make any further refinements to the modified Flicker, that is, the electronic Flicker, after the demonstration to Bally on September 26, 1974?

A Yes, we did.

Q What did you do?

A Primarily as a result of conversations I had with Dan Conroy after this meeting, whereby they expressed concern over the digits being permanently placed, as we did on the game, that for ongoing games it would limit the artist in terms of back glass and so on, and that they thought it best that the digits would be freestanding and be allowed to be replaced anywhere by the artist.

That was about the only real negative thing that they could come up with in terms of what they

saw at the time.

Q Did you describe that later modification with respect to the digits in any particular way by any label?

A I was corresponding with Dan Conroy both by letter and on the telephone, and I would then refer to it as like this is Phase 1 and now we are off to Phase 2, where I separated the digits from the PC board.

So on that game the digits are a part of that I/O PC board and they are permanently placed. You can't move them from there unless you move the whole board.

3x

Q And that's -- that was what the -- and the change you made enabled you, a person, to move the digits without moving the whole board.

A Yes. In fact, I then developed the 7-segment digit, an inch and a half size digit, which is kind of the ongoing program I had with digits with my latest design.

And we then made a new PC I/O board, to which we then attached these new readouts using ribbon cable.

Q And did you do something after that that was referred to as a phase 3?

A Yes. The phase 3 was then to actually take -- up to this point the logic part of the system, or the microprocessor logic card was wire wrapped, like it is in that game.

We moved on, and then phase 3 was going to be then the actual hard copy layout of that board, which would then be production ready.

Q Did these refinements that we've called phase 2 and phase 3 require Mr. Frederiksen to change the machine's computer program?

A No. The game played the same. It's just a matter of basically rewiring.

Q Did these refinements require that you make any changes in the layout of the lamps, switches or digits in

the matrix multiplexing system?

A No, we didn't make any change in that.

Q What response then did you finally get from Bally with respect to this development?

A Well, we had an ongoing conversation with Dan Conroy. We went -- also wanted to do a cost analysis. We went through that exercise.

And this went on for months. I kept asking Bally, "Are you really interested? Or what's going to happen?"

Finally began to surface that Bally's own engineers were working on their own system.

Q Who told you that?

A Joe Robbins told me that.

Q Do you recall when he told you that?

A That would have been -- we're probably into '75 -- we'd be in, probably February time frame, '75.

Q Did you then attempt to market your invention to anyone else?

A Yes. Joe Robbins suggested, "Dave," he said, "Bally's not going to take your design. Why don't you go talk to some of the other manufacturers?"

And he suggested that I contact Judd Weinberg at Gottlieb.

Q And did you do that?

A Yes, I did. I sent a letter to Mr. Weinberg. We also had telephone conversations and other ongoing written communication.

Q Did anything come of the negotiations with Gottlieb?

A No. No.

Just to say no.

Q Did you have some discussions about the possibility of entering into a written agreement with Gottlieb?

A Okay. That's why the negotiations broke down.

Judd Weinberg returned me a nondisclosure agreement, which I found unsatisfactory. And that we then negotiated back and forth to try and arrive at a satisfactory agreement, and we never were able to arrive at a satisfactory agreement.

Q I hand you Plaintiff's --

THE COURT: You mean satisfactory nondisclosure agreement?

THE WITNESS: Yes.

BY MR. TONE:

Q I hand you a document marked Plaintiff's Exhibit 65, and I ask you whether you recognize that document?

A Yes. That's the nondisclosure agreement from Gottlieb.

Q And did you receive it shortly after May 16, 1975?

A Yes, I did.

Q Did you make any other efforts to sell your invention?

A During the same period of time John Blahuta, who would stop by our facilities on occasion, came by and we showed him the Flicker game and what development that we had done.

He suggested -- he at the time was a consultant with Mirco Company down in Phoenix, who were in the coin-operated game business.

And he suggested that I contact Mirco and see if we could arrive at a relationship with them.

Q And did you contact Mirco?

A Yes, I did.

Q And did you arrive at a relationship with them?

A Yes. We entered into an agreement with Mirco.

Q And what was done -- was anything done pursuant to or under that agreement?

A Yes. We developed a game for them using our basic logic system, developed a game called Spirit of '76.

Q And when you say you developed a game, can you tell us in a more concrete way exactly what you turned over to them, if anything?

A We developed a preproduction prototype complete with cabinet, playfield and a fully operational logic.

At the time we delivered it to Mirco we had not completed the game software portion of the game,

but we had completed the complete logic system was functional.

4-2

Q Did Mirco ever put the game, as you developed it, into production?

A Not as we developed it, no.

Q Did they eventually manufacture a game, an electromechanical -- an electronic pinball game?

A They took our basic design and implemented it through their own engineering efforts.

Q Did you have any further dealings with Bally with respect to a microcomputer-controlled pinball game?

A Yes, I did.

Q And when?

A It would be in the -- we're now in '75 -- it would be in the late '75, probably the August/September time frame, where we developed a game primarily for consumer.

It was a game called Wizard, which was a takeoff of the Flicker, the basic Flicker playfield.

Q Did it have one or more other names later?

A Yes, it did. Eventually it became -- well, no.

That particular design presented to Bally, which stimulated them through their Midway Division to proceed forward to develop it as a consumer product.

They then suggested not using the Flicker, but using a game called Hocus Pocus as the basic game to

develop.

Q And what did you do, if anything, with respect to Hocus Pocus?

A Okay. So we took the Hocus Pocus game -- Midway designed and developed the actual playfield -- they presented, gave it to us.

We then completely interfaced it into our logic system.

Q And was the Hocus Pocus pinball game you got from Bally an electromechanical game?

A Well, the original Hocus Pocus game was a commercial game that was produced and sold.

Q A coin-operated --

A Coin-operated game.

Q And was it an electromechanical game?

A Oh, yes, that was electromechanical.

Q And did you get one of those for use in developing the project?

A We had one of those. Yes, we did.

Q All right. And then you, as you said, provided the interface and the electronic controls. Is that right?

A Yes. Then we developed and brought up to a pre-production prototype state a working Hocus Pocus using our microprocessor system.

And the Hocus Pocus eventually became known

as Fireball.

Q And was Fireball put into production by Bally?

A Yes. Fireball was put into production by Bally, I believe, in August '76.

Q Do you recall whether the Fireball had a playfield memory feature such as was described earlier in our colloquy and in the colloquy you heard before you took the witness stand?

A Oh, yes. The Fireball employed playfield memory, because that was one of the major, major game features that the microprocessor allowed us to do.

In fact, we had playfield memory in the Spirit of '76 for Micro.

Q Do consumer -- no -- Fireball, I take it, as marketed and sold by Bally commencing in August 1976 was a Mirco processor-controlled pinball game. Is that correct?

A Yes, that is correct. I believe we used the F-8 in that unit.

Q But instead of being coin-operated, it was -- it was-- it didn't require the insertion of a coin to make the game operable. Is that right?

A That is correct.

Q Because it was for consumers' use in their homes, right?

A That is correct, right.

Q How does a consumer game differ from a coin-operated game?

A Our goal there, of course, was to be cost effective; that we were able to minimize the amount of electronics required.

We reduced the amount of features from the Hocus Pocus. We had lesser components on the playfield. We were able to achieve scoring using just one set of digits, yet we were able to achieve a 4-player game by cycling the digits between players.

Q Did you ever enter into a contract with respect to the Fireball game with Bally?

A We had an existing, ongoing contract which we had modified just to cover that game, because our other contract did not cover pinballs.

4x

15-1b1

Q. Did you file a patent application on your electronic pinball invention?

A. Yes, we did.

Q. Was that in May 1975?

A. May '75, right.

Q. The patent issued in June 1978?

A. That is correct.

Q. The reissue patent in November 1983, is that correct?

A. That is correct.

Q. I show you Plaintiff's Exhibits 5-A and 5-B.

Do you recognize these documents?

A. 3-A is an assignment from Jeff and I to Dave Nutting Associates.

Q. Assignment of what?

A. Of the patent rights.

Q. Of the rights in the patent in issue in this case?

A. Yes.

Q. That is to say, the original application?

A. The original application.

Q. What is the second document, 5-B?

A. Let's see. This is an assignment from Dave Nutting Associates to Dave Nutting Associates, Inc., I believe. We are now incorporating.

Q. Is that your signature on the bottom of the document?

A. Yes, it is.

Q Is that Jeff Frederiksen's signature under yours?

A Yes. That is Jeff's signature.

Q Did you sign it on or about the date it bears?

A 21 September. My copy I cannot read. Is that '77?

Q Yes.

A Yes, that is correct.

Q Was your signature and Jeff Frederiksen's signature or signatures -- I see you signed it twice -- were those signatures notarized on that date?

A Yes, it appears that way.

Q Who holds title to your patent on the electronic pinball game today?

A Bally Manufacturing.

Q How did Bally acquire it?

A Bally acquired the rights to the patent upon acquiring Dave Nutting Associates, Inc. in 1977.

Q Now, I show you the assignment. I misspoke earlier.

I now show you the assignment, what purports to be the assignment of the patent to Bally, a certified copy thereof having been handed to the Court.

It is marked Plaintiff's Exhibit 6.

Do you recognize that document?

A Well, it is an assignment of Dave Nutting Associates to Bally Manufacturing, yes.

MR. TONE: May I have a moment to confer, your

Honor?

THE COURT: yes.

(Brief interruption.)

MR. TONE: That concludes the direct examination, your Honor?

I am sorry. I meant to offer the exhibits, which I forgot to do.

Plaintiff offers the following exhibits identified during the direct testimony of Mr. Nutting: Plaintiff's Exhibits 5, 5-A, 6, 29, 32, 37, 65, and 325.

THE COURT: They are all received.

(Plaintiff's Exhibits 5, 5-A, 6, 29, 32, 37, 65 and 325 were received into evidence.)

THE COURT: Cross examine.

CROSS EXAMINATION

BY MR. LYNCH:

Q Mr. Nutting, you testified about an earlier letter in 1968 when you suggested to your friend or then business associate about solid state games, correct?

A That is correct.

15-2

Q You were not talking about microprocessor-controlled games, were you?

A Not at that time, no.

Q Microprocessors were not even on the market at that time, were they, Mr. Nutting?

A I cannot vouch for that. To my knowledge, they were not on the market at the time.

THE COURT: Now, this probably takes us back to the first minute of the trial, but the difference between solid state and microprocessor controlled is?

MR. LYNCH: It would be TTL or random logic game where the wires and the logic in here would be replaced by solid state logic.

I think we will bring it out.

THE COURT: You mean transistor?

MR. LYNCH: Transistor logic, that TTL logic.

THE COURT: Transistors and microprocessors do not necessarily have to go hand in hand?

MR. LYNCH: No. Microprocessor, your Honor, has this flexibility.

The Court could appreciate that you could have a large circuit, but when I push this button, 500 lights up here, just by taking it through a large network of electronic circuitry.

The difference about a microprocessor --

when they became available, you put an intelligence item in the middle. So you could tell it in this application, when I push this button, I want you to light 500.

Then you can come to the next application and change it and say when I push this button now, I want it to say 200 or I want a bell to ring instead of a light to light.

That is basically the functional difference that became possible with microprocessors because the software --

THE COURT: Solid state has nothing to do with control, is that it?

MR. LYNCH: Solid state just means that it was not tubed.

THE COURT: It is transistors instead of tubes, okay.

MR. LYNCH: Of course, microprocessors are made up of solid state components.

BY MR. LYNCH:

Q You were involved in the games industry in the early '70s, weren't you, Mr. Nutting?

A Yes.

Q You came to know the fact, did you not, that microprocessors became to become suggested for use with various games in the trade journals?

A No. I became aware of microprocessors through vendors who would call on our establishment.

Q Did you become aware of articles in trade journals and the like indicating --

Well, for example, I show you what has been marked as Exhibit 1-P, an electronic news article entitled, "Nevada Testing Chip Controlled Gaming Machines."

You were involved in that type of business, weren't you, Mr. Nutting?

A No, I was not.

Q It mentions in that article microprocessor-controlled pinball machines.

But you are not aware of any indication that microprocessors were suggested for pinball machines?

A No. I was not aware.

5-3b1

aware

Q Did you have an appreciation of the -- prior to your discussions with Mr. Frederiksen, did you have an appreciation of precisely what advantages might be descended from using a microprocessor in an arcade game of any type?

A Well, a visit by the National people, they described what a microprocessor was. And at that time I then became aware that it would be perhaps possible to have the stable logic system whereby the game designer to change the games would merely be a software endeavor.

Q The National sales people are people from National Semiconductor?

A That is correct.

Q They were calling on you as a potential customer, correct?

A That is correct.

Q They knew you were an arcade games company, correct?

A That is correct.

Q Involved in all these games, and at this point in time, is it not the case that microcomputers were being promoted by those salesmen for a whole host of new applications, Mr. Nutting?

A Yes, that is correct.

Q They told you about applications, and they indicated to you that you might be able to use microprocessors in games,

isn't that right?

A. No. They did not tell us. They just exposed to us what they had and what they were developing.

Q. At that time, Mr. Nutting, companies like the major game companies, Bally and the like, had really established the manufacturer of arcade games as a very efficient manufacturing operation, had they not?

A. I am not qualified to answer that one.

Q. You were not aware of the state to which or the manufacturing abilities of these companies to turn out these games such as electromechanical pinball games, shuffle alley games, and the like?

A. I knew they were vertically orientated, that they had complete in-house capability.

Q. These logic systems, these complicated-looking logic systems, were turned out in vast numbers by these companies, isn't that correct?

A. I never had any access to what numbers they were manufacturing.

Q. You knew and you indicated to Mr. Frederiksen, didn't you, that pinball was the backbone of the arcade business?

A. Pinball was the backbone of the arcade business.

Q. You knew the arcade business. So you knew there were a lot of pinball machines out there, didn't you?

A. It depends on what a lot is; more than one.

Q Well, you indicated that you began your discussions with Mr. Frederiksen sometime in the fall of '73?

A That is correct.

Q Was your principal objective to get into pinball, or was your principal objective other games?

A Principal objective was pinball.

Q You were going to take on the major pinball companies, is that correct?

A That was my goal.

Q I show you what has been marked as Defendants' Exhibit 16-B, Mr. Nutting.

I ask you if you can identify that document.

What is that document, Mr. Nutting?

May it please the Court, your Honor -- would the Court like to see a copy?

THE COURT: Yes.

BY MR. LYNCH:

Q What does the document 16 do?

A It appears to be an MCI board meeting agenda.

Q Were you on the board of MCI?

A At this time I believe I was.

Q This is December of 1973, correct?

A Yes.

Q This is right at the time that you and Mr. Frederiksen were putting drawings on the board and talking about microprocessor-controlled games, correct?

A Yes.

Q Is there a mention of this microprocessor-controlled pinball effort in the MCI board meetings of December '73?

A There's no reference at all to any engineering projects.

Q Do you know if there's any reference at all in any document of MCI to microprocessor-controlled pinball before the end of 1973?

A I'm not sure if I can answer that.

Q Well, suffice it to say you haven't seen any today, have you, Mr. Nutting?

A Any what -- you say --

Q Any documents referring to microcomputer-controlled pinball dated before the end of 1973 at MCI.

A What documents -- depends what you call documents. Saw sketches and blackboard drawings.

Q Those sketches and blackboard drawings were reproduced later, so that's all we have is the recollection of what was on a blackboard in December of 1973. Correct?

A. The -- our engineering style at that point was sketches and blackboards. It was not efficient documentation.

Q. But this, the taking on of the three major pinball companies, this indeed was going to be a major project for MCI, was it not?

A. If I was able to convince management, yes.

Q. Well, you were part of management. That's fair to say, isn't it, Mr. Nutting?

A. Minor part.

Q. All right. So you had the Air Ball game.

Now, you indicated the Air Ball game was like pinball. In the Air Ball game you had to pass a ping pong ball through gates and loops and things of that nature, correct?

MR. TONE: I object only to that part of the question that characterized the witness' previous testimony by saying that he said the pinball game -- or the earlier game was like pinball.

I don't think he said quite that.

BY MR. LYNCH:

Q. I think he said -- I beg your pardon. I thought you said it was like a vertical pinball, three-dimensional pinball.

A. I said like a three-dimensional pinball, yes.

Q. Now, in this you had -- this was controlled with solid state electronics, correct, the Air Ball?

A. Which version are we referencing to?
Q. Well, there was a solid state version of Air Ball, correct?
A. That is correct.
Q. And there was an electromechanical version of Air Ball, correct?
A. That's correct.
Q. And in the electromechanical -- the solid state version of Air Ball, was there a problem with switch sensing or solenoid activation or digital readout activation or lamp activation?
A. Which version?
Q. The solid state version?
A. We had some various noise problems.
Q. You had noise problems with that.
A. Electrical noise.
Q. Were they ever solved?
A. In that particular iteration, we never solved them.
Q. Well, then, you had this microprocessor-controlled Air Ball prior to the time you went to the MOA show?
A. No. It was not a microprocessor.
Q. I'm sorry. The TTL-controlled Air Ball.
A. What was the question again?
Q. At the time you went to the MOA show in October of '73 you had this Air Ball game, correct?

A. Which Air Ball game?

Q. Both Air Ball games.

A. One was an engineering exercise and the other was one we actually manufactured.

Q. And it never went any farther, the engineering exercise?

A. Not with that particular design.

Q. And you never tried to adapt Air Ball to a microprocessor design, did you?

A. No, we did not.

Q. Now, you did testify that there came a time that you felt you had to bring -- you had to acquaint Mr. Frederiksen with the intricacies or details of pinball, correct?

A. Correct.

Q. Now, when you approached Mr. Frederiksen about this idea of having microprocessor-controlled games, you knew that in order to accomplish that that you required someone with an understanding of electronics. Isn't that correct?

A. Yes.

Q. You couldn't have done it because you didn't have an understanding of electronics that was sufficient. Is that fair to say?

A. Yes.

Q. So you needed someone proficient and skilled in electronics to work with you, correct?

A. That is correct.

Q Now, that person, Mr. Frederikson, though, didn't have your background in the pinball art, did he?

A No, he did not.

Q I mean, is it sufficient to have background in a pinball game to misspend your youth, as Mr. Goldenberg has characterized it, at a pinball arcade?

THE COURT: To do what?

MR. LYNCH: Misspend your youth.

THE COURT: No. Is it necessary for what purpose?

BY MR. LYNCH:

Q Is it necessary in order to become familiar with pinball to work with it on the basis you wanted Mr. Frederiksen to work with it, is it sufficient merely to have played the game? Because Mr. Frederiksen had played pinball games, but he had to become more familiar with them than that. Isn't that correct?

A Yes, he did.

Q And he had -- you had to get the game and study the reaction of the ball on the playfield, correct?

A That's correct.

Q He had to become more familiar with pinball than a typical electronic engineer would be. Isn't that correct?

A That's correct.

Q And so that is what you educated Mr. Frederiksen on in the late months of -- early months of 1974, I guess it

would have been. Correct?

A It was ongoing education.

Q Yes, but insofar as pinball was concerned, that's what it was.

Now, I show you also, insofar as the records of the pinball project are concerned, I show you another document, Defendants' Trial Exhibit 16-E. Can you identify that document?

Now, I call to your attention, Mr. Nutting, this appears to be a joint meeting of the board of directors of Red Baron Amusement and MCI.

You signed it, but it's indicated you were absent from the meeting.

I call to your attention, Mr. Nutting, that there's a mention of the Safe game, S-a-f-e game, at the last paragraph of the first page of Exhibit 16, but no mention of pinball.

What was the status of the project at this time in March of 1974?

A Well, March of '74 we were in that phase of development, the Intellec had not arrived. So it was in the state of which I described earlier.

Q Was it the major engineering project that you had at MCI at that time?

A No, it was not, because we were -- let me re-do that.

The major project at that time was the Super IQ, which was then the same as the pinball project.

Q This is -- around this period of time you indicated that you were discussing the matter with Mr. Frederiksen and your reservation about his whole proposal was that the switches on pinball closed relatively slow, you said. Correct?

A No, I didn't say that.

Q I thought you said a rollover switch might be closed for as long as a second.

A I said that, yes.

Q And you were wondering how that would be handled. Correct?

A Handled how?

Q By the microprocessor.

A I was questioning how he would interface the two worlds together, yes.

Q And you were saying: How would he interface the world of microseconds of the microprocessor with the world of tenths of seconds on a pinball game. Correct?

A That's correct.

Q In other words, you regarded pinball as being a game that was a lot slower than the microprocessor. Correct?

A Yes.

Q You also indicated, after you saw the demonstration

of the lights in a sequence that all lit up without flicker, I believe your testimony was that you asked Mr. Frederiksen about the switches. Correct?

A Specifically what did I ask him?

Q I think you said, you asked him what about the switches, and he said, "I'll take care of that in software."

Is that what happened?

A Basically.

Q It is what happened, isn't it?

A That's what he told me, yes.

Q So he was going to take care of difficulties with the switches with the software of the microprocessor. That's what he was telling you, correct?

A To the best of my recollection that's what he indicated.

Q Now, sometime during this period you entered into an arrangement with Bally, did you not, Mr. Nutting?

A Which period, now, are we at?

Q Mid to late 1974.

A Yes, but it's '74.

Q. Now, there was no written agreement when you first entered into this arrangement with Bally, isn't that correct?

A. It was an oral agreement.

Q. It was an oral agreement, and you were going to assist Bally in what, the design basically?

A. The design of arcade games.

Q. This was to extend beyond pinball games, correct?

A. The --

Q. Well, did it have anything to do with pinball games?

A. The relation was primarily with Midway to do arcade games.

Q. Of what type?

A. To do the type of games that Midway was the manufacturer of.

Q. What was the type of game of which Midway was the manufacturer?

A. Arcade games.

Q. Gun games, driving games, pinball games, shuffle alley games? What kind of games?

A. Gun games, driving games.

Q. But not pinball games?

A. Not at that moment in time Midway did not produce pinballs, but, of course, Bally didn't.

Q. Now, I show you Exhibit 16-J, a memorandum of meeting.

1,2cbLB

This indicates that at that time there was an undertaking or there were negotiations about sale of the entirety of MCI, I take it, to Bally, is that correct?

A. I cannot respond to that one without getting into --

Q. You are not familiar with that? You are not familiar with what was going on at that time in that connection?

A. Vaguely. I was not that intimately involved.

Q. Now, when you left MCI, you took the relationship -- strike that.

The relationship that began with Bally about Midway about the design of arcade games, did that begin prior to the time you left MCI or after you left MCI?

A. We were having discussions with Bally-Midway prior to my actual leaving, yes.

Q. Was the agreement more or less handshook on after you left MCI, however?

A. Handshook, by whom?

Q. Pardon?

You had an oral understanding. Was that oral understanding arrived at after you left MCI?

A. No, it would have been before. It was all -- everybody knew I was leaving and what we were doing.

Q. That oral understanding never included pinball games, isn't that correct?

A. No. It included any and all of -- anything we developed.

-1,3cbLB

Q. I show you what has been marked as Exhibit 4-Z, Mr. Nutting.

Now, Exhibit 4-Z is a document which is an agreement between yourself and Mr. Frederiksen and Bally and Midway, correct?

A. Yes, it is.

Q. This agreement is a memorialization, is it not, of the oral understanding that took place between yourself, Mr. Frederiksen, and Midway and Bally around mid-1974 that you had testified about, correct?

MR. TONE: May I inquire of counsel? We do not seem to have the exhibit.

(Brief off the record discussion.)

BY MR. LYNCH:

Q. Is that correct?

A. Could you re-ask the question, please?

-2

Q That is the written memorialization or written version executed in February 1975 of the oral understanding that you developed with Bally sometime beginning around the time before you left MCI and extending through the latter part of 1974, correct?

A That is correct.

Q That oral understanding was in effect at the time that you made the demonstration of the Flicker electronic pinball game to the gentlemen from Bally on September 26, 1974, correct?

A That is correct.

Q Now, you then became aware of the fact, did you not, Mr. Nutting, sometime after the demonstration and before the time of this agreement in February '75 that Bally had its own microprocessor-controlled pinball project under way, correct?

A That is correct.

Q They told you, in fact, didn't they, that they had such a project under way prior to the time that they attended the demonstration, isn't that correct?

A That is not correct.

Q Didn't they tell you that it had been in effect for almost a year?

A They did not.

Q I refer you to the second page of the agreement,

Exhibit 4-Z.

It is Exhibit 4-Z, your Honor.

In the first full paragraph on that page, it indicates, quote, in the second sentence,

"The corporations have advised Nutting that work had been commenced by the corporations on a similar project prior to any such disclosures by Nutting."

THE COURT: Excuse me. I do not follow where you are.

MR. LYNCH: The second full paragraph.

THE WITNESS: Which page?

MR. LYNCH: The first full paragraph, the second sentence, your Honor.

THE COURT: On page?

MR. LYNCH: On the second page. I am sorry.

THE COURT: Page 2 of the agreement.

MR. LYNCH: I did not realize.

THE COURT: The second full paragraph.

MR. LYNCH: The first full paragraph, second sentence.

THE COURT: All right. I have it. Thank you.

BY MR. LYNCH:

Q It indicates that:

"The corporations have advised Nutting

"that work had been commenced by the corporations on a similar project prior to any such disclosures by Nutting."

Do you see that, Mr. Nutting?

A Yes.

Q That refers to microprocessor-controlled pinball, does it not?

A Yes, it does.

Q This agreement, Exhibit 4-Z, is an agreement that you signed, is it not?

A Yes.

Q So the agreement at any rate indicates that Bally had informed you prior to the September 26th meeting that they had under way a microprocessor-controlled pin project, correct?

A No, that is not correct. This part of the agreement was put into our agreement such that we could then go forth and contact other manufacturers other than Bally.

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Q. So the indication is a misrepresentation of the facts? The provision in the agreement is a misrepresentation of the facts?

A. I did not interpret it. you interpreted it.

Q. It is not the true fact, the representation in the agreement? Is that what you are telling me, Mr. Nutting?

A. I am not saying anything. You can interpret whatever way you want.

Q. Mr. Nutting, all I want to know is: Is the statement there that, "The corporations have advised Nutting that work had been commenced and the like," subscribed by you?

Is that statement true, or is it not true?

A. What are you asking me as to what is true and not true?

Q. Is it true or not true that you were informed or told by individuals at Bally sometime prior to the execution of the agreement, 4-Z, that Bally had instituted an effort to create a microprocessor controlled pin game prior to the time that they came to your facilities on September 26, 1974?

A. If that is what they are claiming, that is what they are claiming. I cannot speak for them.

Q. You did sign the agreement?

A. Of course. I signed the agreement primarily to allow

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us to seek other manufacturers for pinball design. It was the whole reason for the paragraph.

THE COURT: Let me interrupt for just a moment. When everybody is here on the Bratton against Shriffrin case, I want to go forward with it, but if you are not all here yet, I want to continue with what I am doing.

(Brief off the record discussion.)

MR. LYNCH: Should we stay, your Honor?

THE COURT: No, because this will take the rest of the afternoon. That is what I am about to do.

So I will see you folks again at 9:30 Monday morning.

MR. LYNCH: Thank you, your Honor.

MR. GOLDENBERG: Thank you, your Honor.

(The proceedings of the within trial were adjourned until Monday, January 9, 1983, at 9:30 o'clock a.m.)